AUTHOR: Trukov, I.N. and Gel'd, P.V. 133

TITLE: On the eutectoidal decomposition of leboite. (Ob evtektoidnom raspade leboita).

PERIODICAL: "Fizika Metallov i Metallovedenie" (Physics of Metals and Metallurgy) 1957, Vol.IV, No.1 (10), pp. 190-191 (U.S.S.R.)

ABSTRACT: The heating curves of specimens which were subject to a preliminary stabilisation anneal at 850 °C indicate that the temperature range of stability of leboite depends on the silicon content of the alloys, and that leboite is stable in alloys containing below 50% Si only above 950 °C and in alloys containing over 50% Si above 915 - 925 °C. Additions of Al, P and Ca slow down the speed of decomposition of leboite. 2 Russian references.

Ural Polytechnical Institute imeni S.M. Kirov.

Recd. Sept. 28, 1956.

STRUKOV, I. N.

126-1-38/40

AUTHORS: Strukov, I. N., Shumilov, M.A. and Gel'd, P. V.

TITLE: Influence of the heat treatment on the topography of calcium in ferrosilicon. (Vliyaniye termicheskoy obrabotki na topografiyu kal'tsiya v ferrosilitsii).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.1, pp. 188-189 (USSR).

ABSTRACT: In earlier work (Refs.1 and 2), the authors showed that the stability of a high percentage commercial ferrosilicon during storing in humid air is dependent to a considerable extent on its thermal history. Particularly, it was found that annealing of ferrosilicon at temperatures which ensure decomposition of leboite leads to a sharp increase of the stability of the alloy. It was, however, not possible in the earlier work to solve unequivocally the problem of the causes of this effect during heat treatment, which could be explained on the one hand by the elimination from the alloy of a metastable phase, the decomposition of which is accompanied by an appreciable increase in volume and thus by occurrence of high internal stresses and on the other hand the possibility could not be excluded of redistribution of the admixtures which are responsible

Card 1/4

Influence of the heat treatment on the topography of calcium in ferrosilicon.

for the reduced stability of ferrosilicon (e.g. calcium-aluminium). For verifying the influence of heat treatment on the conditions of localisation of calcium, autoradiography investigations were carried out of hardened and annealed alloys. Ca^{45} was used as a radio-active isotope which has a β-radiation with a maximum energy of 0.259 MeV. Preliminarily, alloys were produced from mixtures of powders of commercial silicon and the Ca^{45} by heating inside an hermetically sealed ampule of armco iron in vacuum equipment at 900°C for two hours. The thus obtained material (fundamentally calcium silicide) was introduced with the iron ampule into the molten ferrosilicon containing 60 to 65% Si. After careful mixing of the metal in the crucible inside an induction furnace, specimens were prepared for investigation. On the polished surface photographic films НИКФИ, type MK, were placed; the exposure time was about ten days, the specific activity of the alloy was 0.8 to 1 m Curie/kg. Microscopic investigation of the autoradiographic pictures has shown that in the hardened specimens the calcium is distributed highly

Influence of the heat treatment on the topography of calcium in ferrosilicon.

non-uniformly, concentrating mainly along the crystallite boundaries. However, for annealed specimens the difference in the calcium concentration at the surface and in the volume of the crystallites is considerably lower, see Fig.1, showing the distribution of calcium in a ferrosilicon specimen containing 60% Si after hardening and after annealing respectively. Thereby, homogenisation of the calcium distribution increases with increasing annealing duration and, consequently, also with the completeness of leboite decomposition. Subsequent hardening of the annealed specimen from 1000°C leads again to a preferential separation of calcium in the intercrystallite range, which can be eliminated by repeating the stabilisation annealing. Thus, the obtained data indicate that the solubility of calcium in leboite and in its decomposition products differs appreciably. This permits controlling the topography of calcium in a high percentage ferrosilicon by means of heat treatment. Annealing, which brings about a homogenisation of the calcium distribution, prevents local accumulations which could serve as loci of active interaction with the air

Influence of the heat treatment on the topography of calcium in ferrosilicon.

moisture, i.e. as nuclei of disruption of the alloy. It is pointed out that annealing makes the alloy more stable also as a result of considerable breaking up of the grains. Consequently, heat treatment increases the stability of ferrosilicon during storage, apparently not only as a result of the considerations discussed in the earlier work (Refs.1 and 2) (internal stresses during ageing of the alloy) but also due to changes in the topography of calcium. It is, therefore, advisable to verify the effect of annealing on the distribution of other admixtures which play a role in the stability of the alloy.
(Note: This is a complete translation).
There are 1 figure and 2 references, both of which are Slavic.

SUBMITTED: January 23, 1957.

ASSOCIATION: Ural Polytechnical Institute imeni S. M. Kirov. (Ural'skiy Politekhnicheskiy Institut imeni S.M.Kirova).

AVAILABLE: Library of Congress.

137-58-1-1160

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 62 (USSR)

AUTHORS: Strukov, I.N., Gel'd, P.V.

TITLE: The Causes of the Slaking of Ferrosilicon in Storage (O prichinakh rassypaniya ferrosilitsiya pri khranenii)

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1957, Nr 72, pp 134-148

ABSTRACT: The investigation is conducted with rapidly-cooled (quenched) Fe-Si, high in lebowite and containing Al, P, and Ca as impurities. It is observed that the process of slaking of the alloy (A) starts with the appearance of fissures and ends in most cases in the pulverization of the A. It is found that the greatest stability is possessed by A with 50% Si (sub-lebowite), intermediate stability by A with 70-80% Si (super-lebowite) and minimum stability by A with 50-65% Si (lebowite), this being explained by the presence in the A of eutectic decomposition in the latter two instances accompanied by an increase in the volume of the A and evoking internal stresses therein. A's not containing impurities did not slake, regardless of the [Si], whereas A's containing both Al and P slaked more intensely than A's containing either of these elements individually. An acceleration

Card 1/2

137-58-6-11660

The Causes of the Slaking of Ferrosilicon in Storage

of the slaking of A with increase in atmospheric humidity was observed, as well as a protective effect produced by coatings of paraffin and drying oil The decisive influence upon the stability of A, particularly when rich in Si, of a stabilizing anneal in the 750-850°C temperature interval, with holding dependent upon the content of impurities in the A, is noted Attention is drawn to the need to study the distribution of additions in lebowite between the crystalline base and the intergranular precipitates before and after annealing. Bibliography 14 references

A Sh.

Card 2/2

SOV/137-58-9-19840

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 248 (USSR)

AUTHORS: Strukov, I.N., Gel'd, P.V.

TITLE: On Transformations in Alloys Containing Lebowite (O prevrashcheniyakh v splavakh, soderzhashchikh leboit)

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1957, Nr 72, pp 149-159

ABSTRACT: Transformations taking place in ferrosilicon containing 34-90% Si were investigated. Dilatometric curves representing heating of alloys containing more than 33.3% Si revealed the existence of significant volumetric effects. The nature of the dilatometric diagrams depends essentially not only on the composition of the alloy being investigated, but also on the preceding heat-treatment history of the latter. If the melt is cooled at a sufficiently rapid rate the lebowite, which forms in the process of crystallization, is stabilized in its high-temperature modification (ξ_α). Subsequent annealing results in a eutectoid decomposition, $\xi_\alpha \rightarrow \xi_\beta + Si$, accompanied by a considerable increase in the volume of the specimen. Eutectoid decomposition of α-lebowite occurs in hardened alloys containing less than 50% Si; in addition, at somewhat higher

Card 1/2

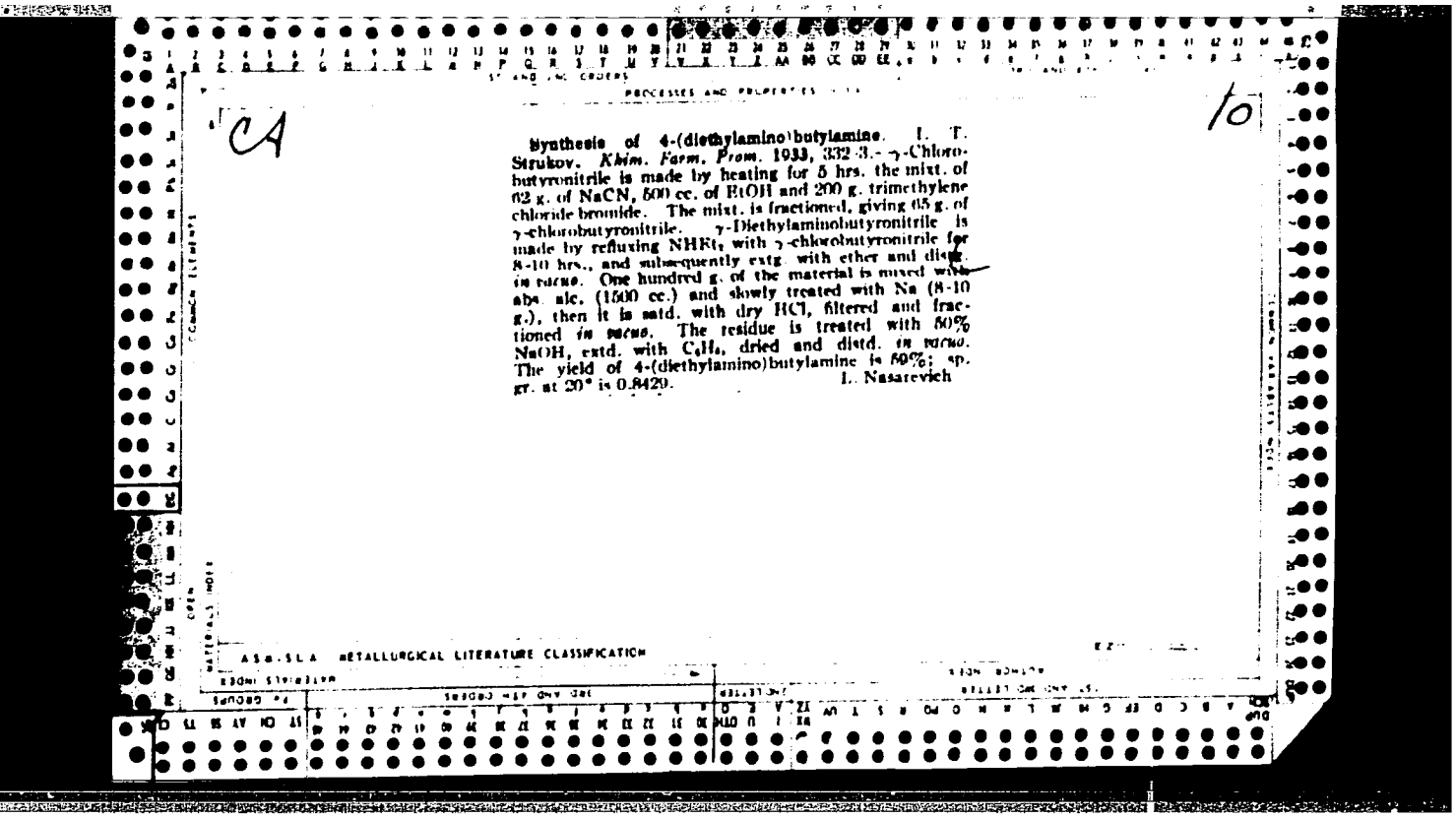
On Transformations in Alloys Containing Lebowite

temperatures (750-950°C), monosilicide reacts with Si (and partially with α lebowite) to form a low-temperature ξ_β phase. The presence of up to 2-2.5% of Al and 0.22% of P in the alloy has little effect on the kinetics of the decomposition of the α lebowite. By contrast, simultaneous presence of these elements results in an abrupt reduction in the rate of the decomposition process. Ca, even in small quantities down to 0.2-0.4%, considerably reduces the rate of lebowite decomposition. Metallographic and X-ray investigations, as well as measurements of thermo-emf and microhardness corroborated the ideas regarding the transformation processes in Fe-Si alloys based on data of the dilatometric analysis. Bibliography: 18 references.

Ya.L.

1. Iron-silicon alloys--Transformations 2. Iron-silicon alloys--X-ray analysis

Card 2/2



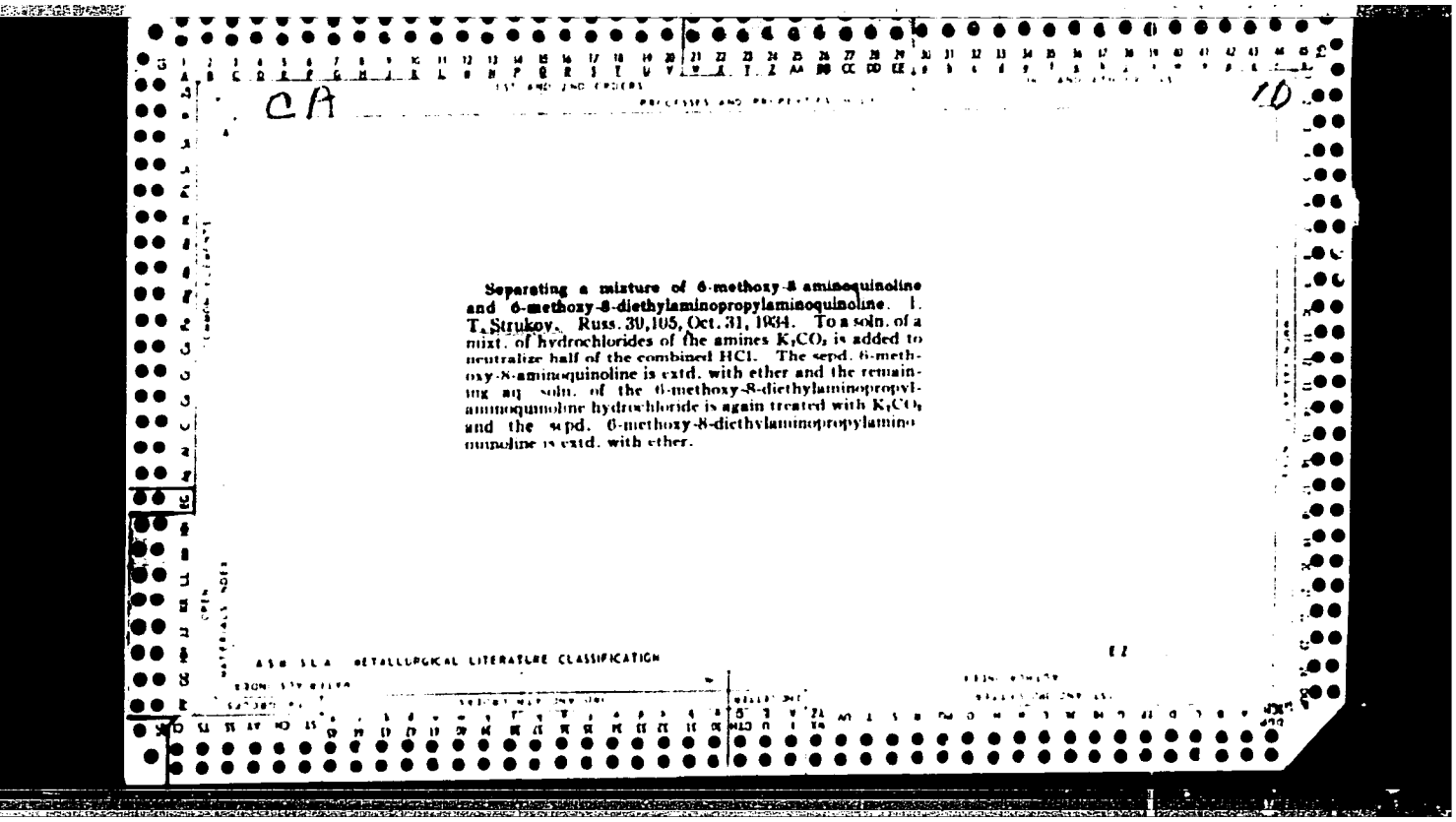
CA

10

Synthesis of 4-(diethylamino)butylamine. I. T. Strukov. *Khim. Farm. Prom.* 1933, 332-3.- γ-Chlorobutyronitrile is made by heating for 5 hrs. the mixt. of 62 g. of NaCN, 500 cc. of EtOH and 200 g. trimethylene chloride bromide. The mixt. is fractioned, giving 65 g. of γ-chlorobutyronitrile. γ-Diethylaminobutyronitrile is made by refluxing $NHEt_2$ with γ-chlorobutyronitrile for 8-10 hrs., and subsequently extg. with ether and distd. *in vacuo*. One hundred g. of the material is mixed with abs. alc. (1500 cc.) and slowly treated with Na (8-10 g.), then it is satd. with dry HCl, filtered and fractioned *in vacuo*. The residue is treated with 50% NaOH, extd. with C_6H_6, dried and distd. *in vacuo*. The yield of 4-(diethylamino)butylamine is 50%; sp. gr. at 20° is 0.8429.

L. Nasarevich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

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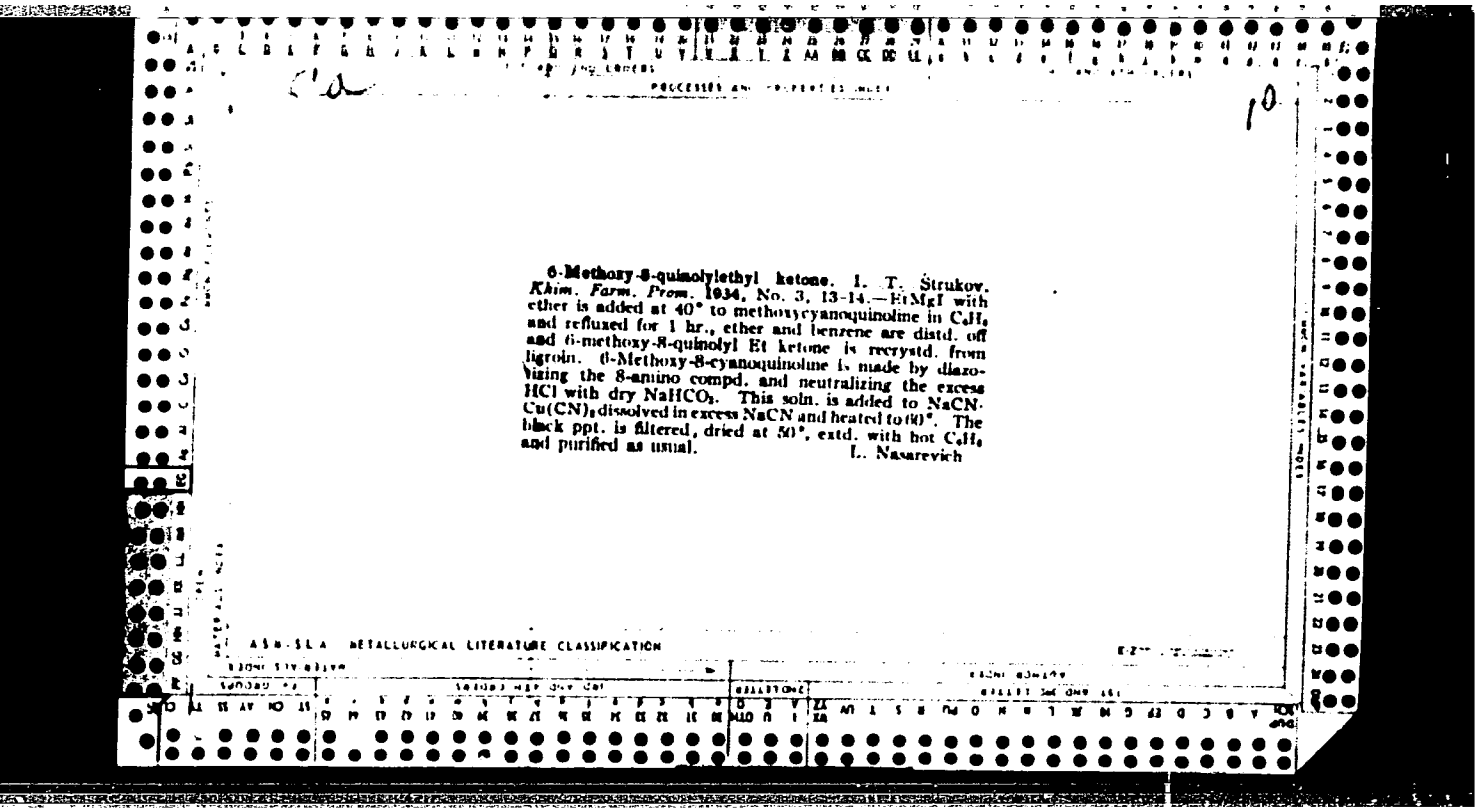
Separating a mixture of 6-methoxy-8 aminoquinoline and 6-methoxy-8-diethylaminopropylaminoquinoline. I. T. Strukov. Russ. 30,105, Oct. 31, 1934. To a soln. of a mixt. of hydrochlorides of the amines K_2CO_3 is added to neutralize half of the combined HCl. The sepd. 6-methoxy-8-aminoquinoline is extd. with ether and the remaining aq. soln. of the 6-methoxy-8-diethylaminopropylaminoquinoline hydrochloride is again treated with K_2CO_3 and the sepd. 6-methoxy-8-diethylaminopropylaminoquinoline is extd. with ether.

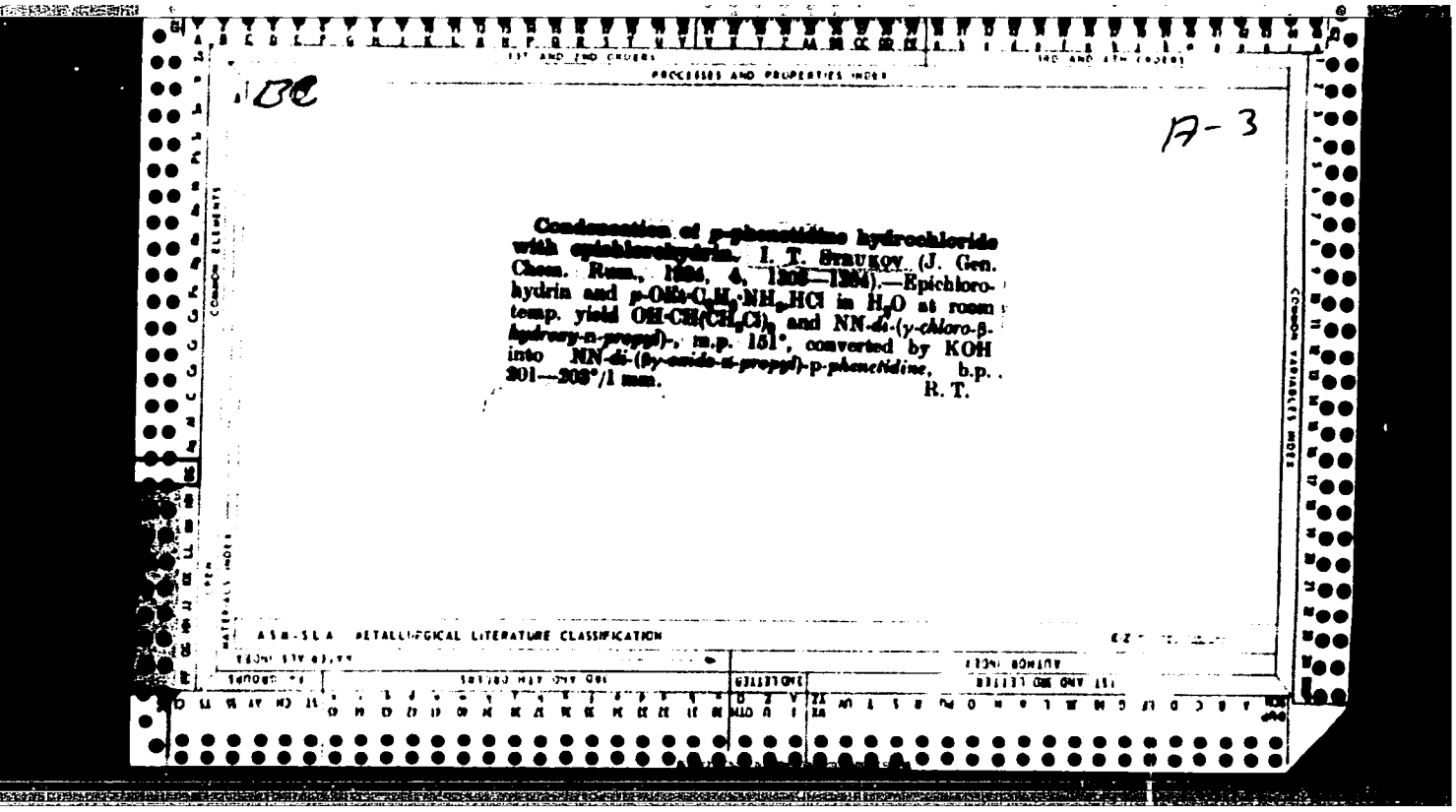
ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

Condensation of p-phenetidine hydrochloride with epichlorohydrin. I. [illegible]. *Khim. Farm. Prom.* 1934, No. 2, 11.—The reaction takes place at ordinary temp.; sunlight accelerates it. p-Phenetidine-HCl (50 g.), 35 g. of epichlorohydrin and 200 g. of H_2O are shaken occasionally for 3 days. The oily crystals of *N,N*-bis(γ-chloro-β-hydroxypropyl)-p-phenetidine (I) are recrystd. from ether-alc. and dried. Yield, 20.5 g. *N,N*-bis(β,γ-epoxypropyl)-p-phenetidine is made by a 10-hr. agitation of I with ether and powd. NaOH at the b. p. of the ether. The ether distd. off and the product, yellow odorless oil, is vacuum-distd. I. N.



6-Methoxy-8-quinolylethyl ketone. I. T. Strukov. *Khim. Farm. Prom.* 1934, No. 3, 13-14.—EtMgI with ether is added at 40° to methoxycyanoquinoline in C_6H_6 and refluxed for 1 hr., ether and benzene are distd. off and 6-methoxy-8-quinolyl Et ketone is recrystd. from ligroin. 6-Methoxy-8-cyanoquinoline is made by diazotizing the 8-amino compd. and neutralizing the excess HCl with dry $NaHCO_3$. This soln. is added to NaCN·$Cu(CN)_2$ dissolved in excess NaCN and heated to 60°. The black ppt. is filtered, dried at 50°, extd. with hot C_6H_6 and purified as usual.

L. Nasarevich



PROCESSES AND PROPERTIES INDEX

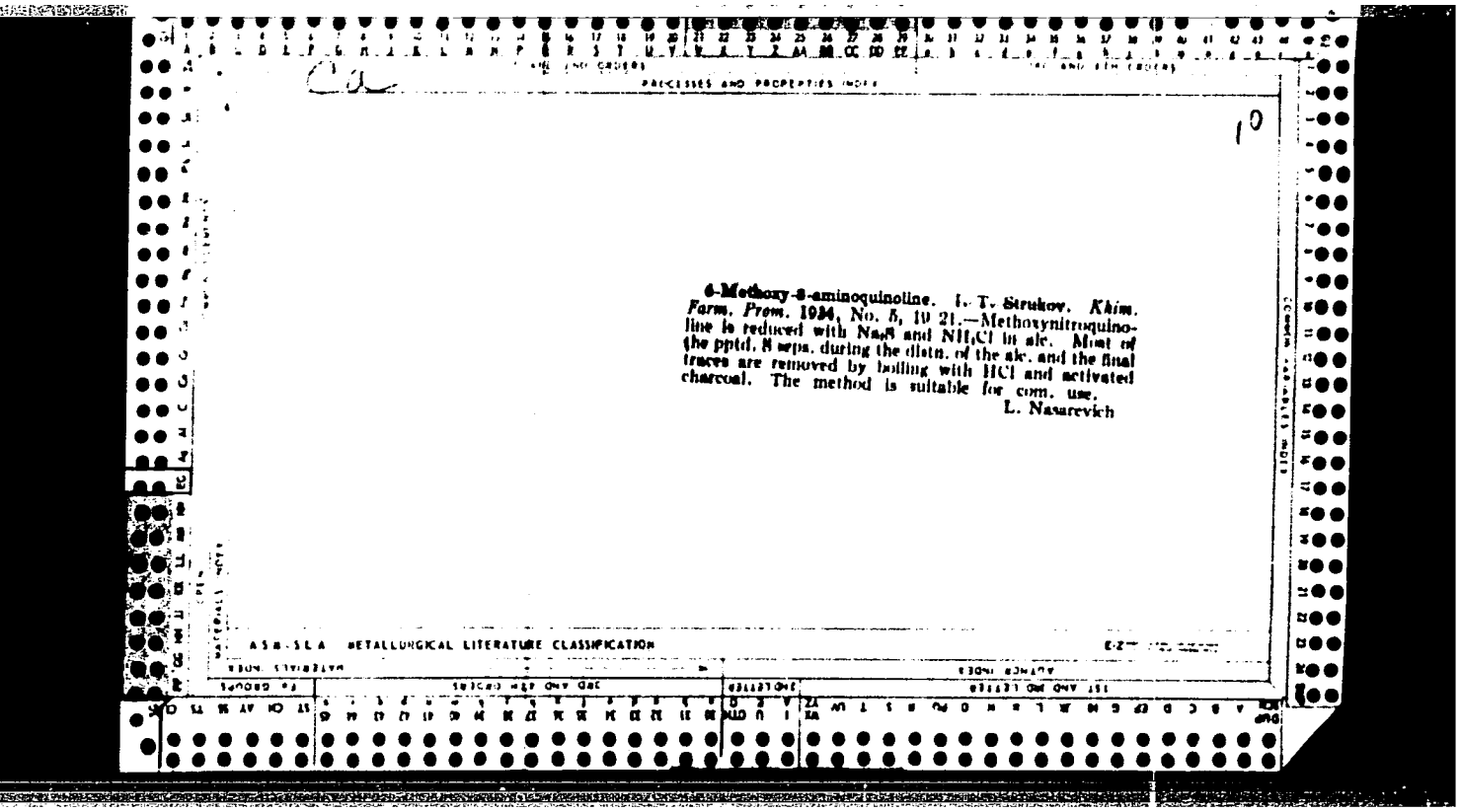
18C

17-3

Condensation of *p*-phenetidine hydrochloride with epichlorohydrin. I. T. Strukov (J. Gen. Chem. Russ., 1956, 4, 1305—1306).—Epichlorohydrin and *p*-OEt·C$_6$H$_4$·NH$_2$,HCl in H$_2$O at room temp. yield OH·CH(CH$_2$Cl)$_2$ and NN-*di*-(*γ-chloro-β-hydroxy-n-propyl*)-, m.p. 151°, converted by KOH into NN-*di*-(*βγ-oxido-n-propyl*)-*p-phenetidine*, b.p. 301—303°/1 mm.

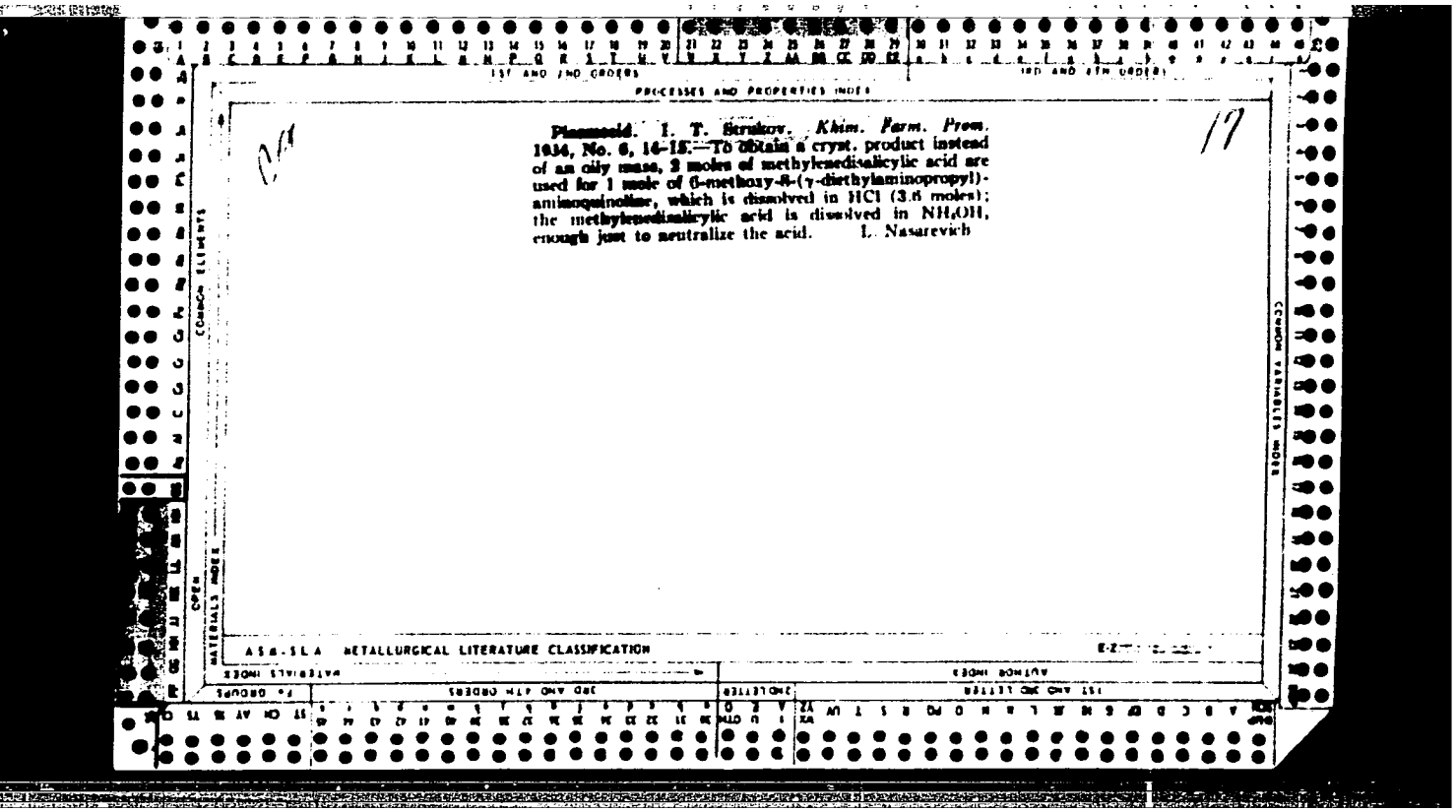
R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

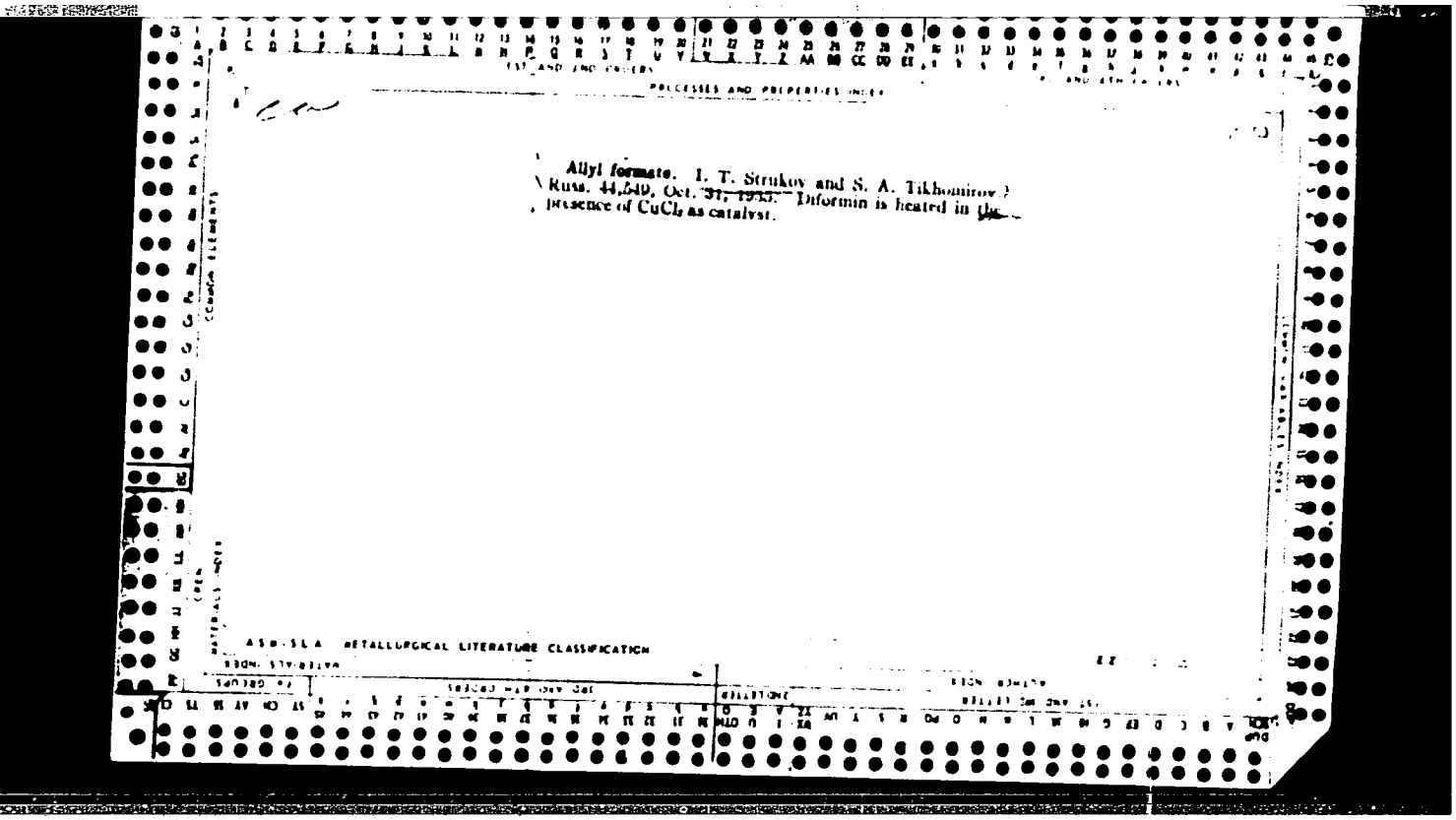


6-Methoxy-8-aminoquinoline. I. T. Strukov. *Khim. Farm. Prom.* 1934, No. 5, 19-21.—Methoxynitroquinoline is reduced with Na_2S and NH_4Cl in alc. Most of the ppt'd. S seps. during the distn. of the alc. and the final traces are removed by boiling with HCl and activated charcoal. The method is suitable for com. use.

L. Nasarevich

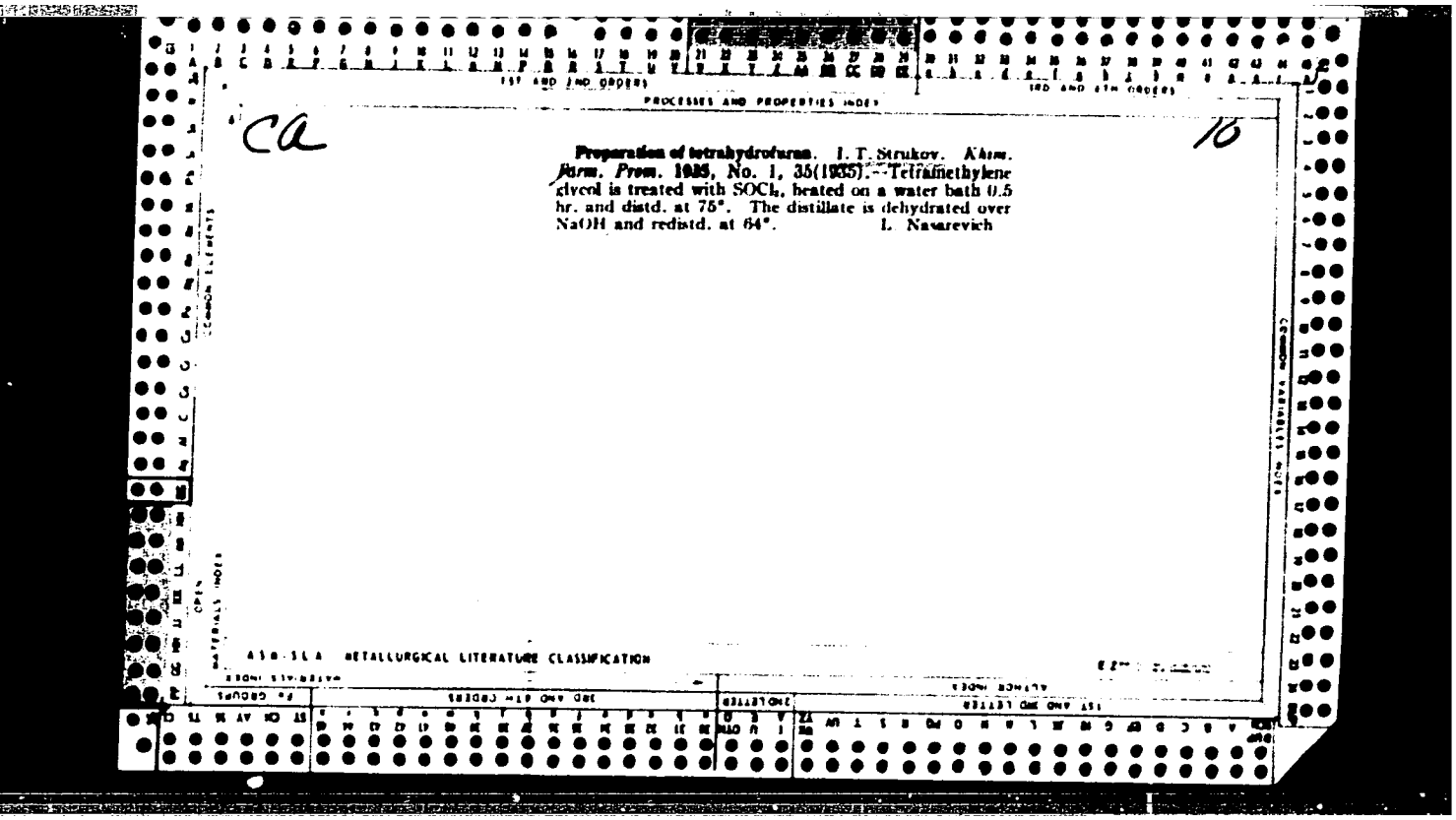


Plasmocid. I. T. Strukov. *Khim. Farm. Prom.* 1934, No. 6, 14-15.—To obtain a cryst. product instead of an oily mass, 2 moles of methylenedisalicylic acid are used for 1 mole of 6-methoxy-8-(γ-diethylaminopropyl)-aminoquinoline, which is dissolved in HCl (3.6 moles); the methylenedisalicylic acid is dissolved in NH_4OH, enough just to neutralize the acid. L. Nasarevich



Allyl formate. I. T. Strukov and S. A. Tikhomirov (Russ. 44,549, Oct. 31, 1935). Diformin is heated in the presence of $CuCl_2$ as catalyst.

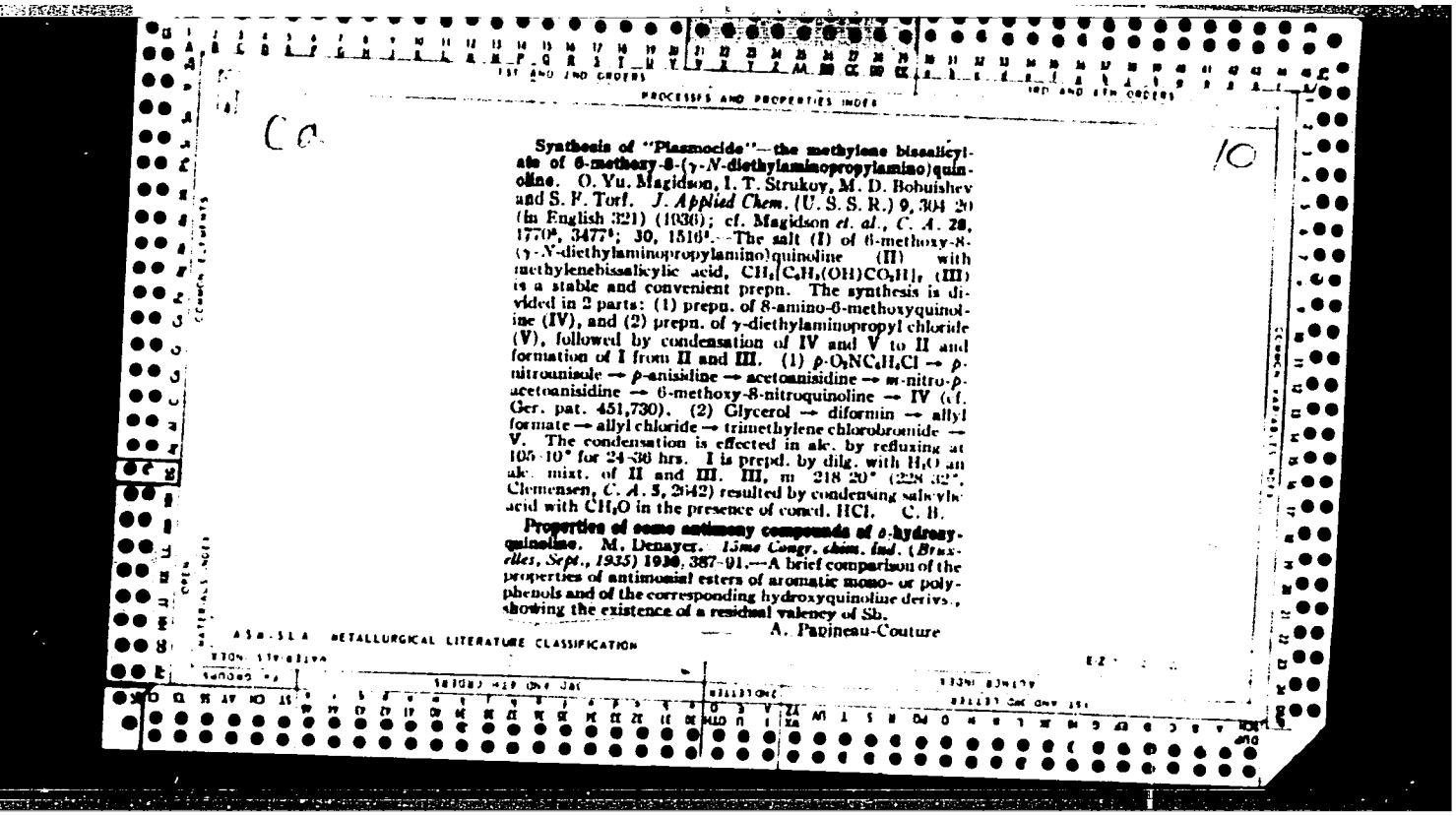
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Ca

10

Preparation of tetrahydrofuran. I. T. Strukov. *Khim. Farm. Prom.* **1935**, No. 1, 35(1935).—Tetramethylene glycol is treated with $SOCl_2$, heated on a water bath 0.5 hr. and distd. at 75°. The distillate is dehydrated over NaOH and redistd. at 64°. I. Navarevich



PROCESSES AND PROPERTIES INDEX

Co

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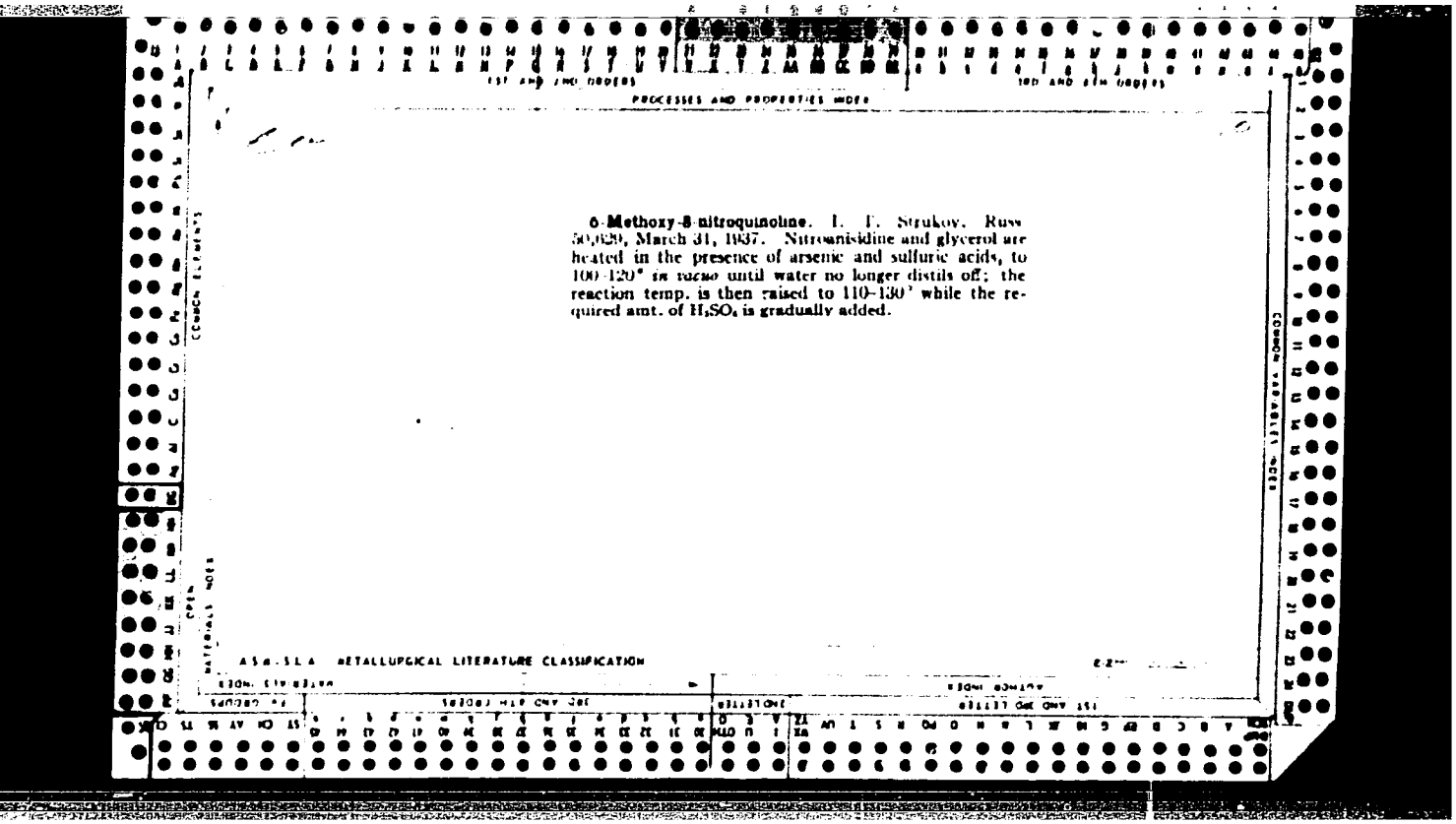
Synthesis of "Plasmocide"—the methylene bissalicylate of 6-methoxy-8-(γ-*N*-diethylaminopropylamino)quinoline. O. Yu. Magidson, I. T. Strukov, M. D. Bobuishev and S. F. Torf. *J. Applied Chem.* (U. S. S. R.) 9, 304-20 (in English 321) (1936); cf. Magidson *et al.*, *C. A.* **28**, 1770[8], 3477[4]; **30**, 1516[1].—The salt (I) of 6-methoxy-8-(γ-*N*-diethylaminopropylamino)quinoline (II) with methylenebissalicylic acid, $CH_2[C_6H_3(OH)CO_2H]_2$ (III) is a stable and convenient prepn. The synthesis is divided in 2 parts: (1) prepn. of 8-amino-6-methoxyquinoline (IV), and (2) prepn. of γ-diethylaminopropyl chloride (V), followed by condensation of IV and V to II and formation of I from II and III. (1) p-$O_2NC_6H_4Cl$ → p-nitroanisole → p-anisidine → acetoanisidine → m-nitro-p-acetoanisidine → 6-methoxy-8-nitroquinoline → IV (cf. Ger. pat. 451,730). (2) Glycerol → diformin → allyl formate → allyl chloride → trimethylene chlorobromide → V. The condensation is effected in alc. by refluxing at 105-10° for 24-36 hrs. I is prepd. by dilg. with H_2O an alc. mixt. of II and III. III, m. 218-20° (228-32°, Clemensen, *C. A.* **5**, 2642) resulted by condensing salicylic acid with CH_2O in the presence of concd. HCl. C. B.

Properties of some antimony compounds of 8-hydroxyquinoline. M. Denayer. *13me Congr. chim. ind.* (*Bruxelles, Sept., 1935*) **1936**, 387-91.—A brief comparison of the properties of antimonial esters of aromatic mono- or polyphenols and of the corresponding hydroxyquinoline derivs., showing the existence of a residual valency of Sb.

A. Papineau-Couture

A5a-5L4 METALLURGICAL LITERATURE CLASSIFICATION



6-Methoxy-8-nitroquinoline. I. F. Strukov. Russ 50,629, March 31, 1937. Nitroanisidine and glycerol are heated in the presence of arsenic and sulfuric acids, to 100-120° *in vacuo* until water no longer distils off; the reaction temp. is then raised to 110-130° while the required amt. of H_2SO_4 is gradually added.

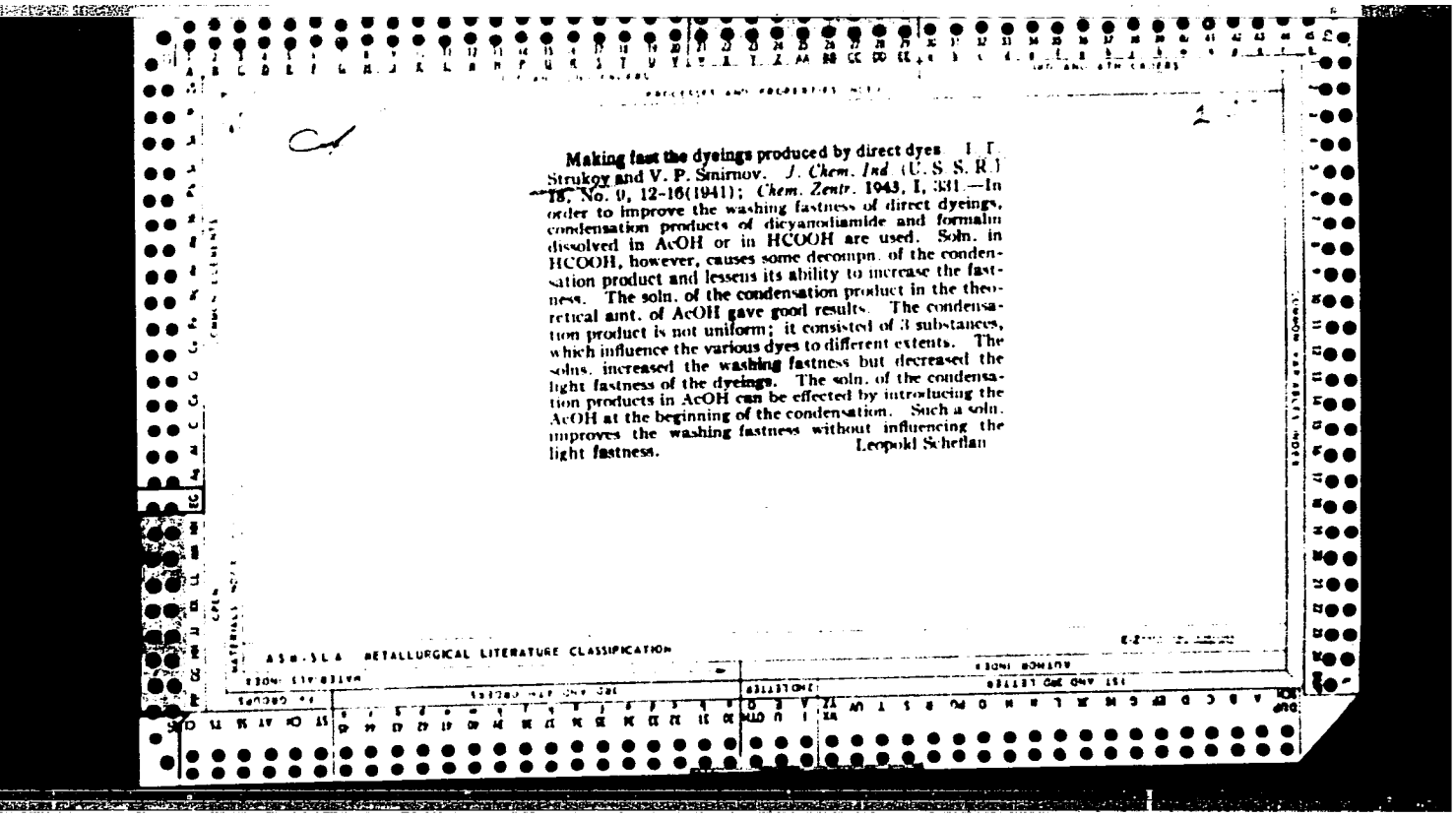
PROCESSES AND PROPERTIES INDEX

CA

Alkylcarbazolesulfonic acids. I. T. Strukov and B. P. Smirnov. *J. Applied Chem.* (U. S. S. R.) 13, 1474-6 (in French, 1476) (1940). — K carbazole (128 g.) and 160 g. BuBr were refluxed at 100-5° for 6 hrs., the excess of BuBr distd., and the residue treated with 30 cc. of PhMe and filtered. The undissolved residue yielded 4.5 g. of carbazole, m. 238-8°. The filtrate, after distn. of the PhMe and redistn. of the residue *in vacuo* (b_7 204-5°), yielded 112 g. of *N-butylcarbazole* (I), m. 56-7°. A mixt. of 50 g. of 90.7% carbazole, 50 g. abs. BuOH and 80 g. anhyd. $ZnCl_2$ was autoclaved at 120-80° for 12 hrs. (the initial pressure, 8 atm.; final (after cooling) 3-4 atms.). The reaction mixt. was treated with 100 cc. water acidified with HCl and 200 cc. PhMe. The PhMe ext., after the usual operations, yielded 54% *dibutylcarbazole* (II). The soln. of I (11.5 g.) in 115 g. dry $PhNO_2$ was treated with 7 g. $ClSO_3H$, added in 30 min. at 5-10°, then the temp. was raised for 3 hrs. to 25°. After 18 hrs. the ppt. formed was filtered out, washed with CCl_4, then with concd. HCl and dried *in vacuo*, yielding *N-butylcarbazolesulfonic acid* (III). Under the same conditions the same reagents yielded the Na or Ba salts of III, if the reaction mass was treated with water, the $PhNO_2$ steam-distd., the aq. soln. neutralized with Na_2CO_3 or $BaCO_3$, evapd. and crystd. The yield of salt was 70%. Under the same conditions II yielded its *Na salt* (yield of 80%), or *Ba salt*. K carbazole (64 g.), 200 g. dry xylene and 61 g. $MeC_6H_4SO_3Me$ were mixed and heated to 70-7°, then at 100° for 1 hr. The reaction mixt. was treated with 100 cc. of water and 50 cc. 10% NaOH and mixed for 30 min. to decomp. the ester. The upper layer was sepd. and after distg. the xylene, the residue was dissolved in xylene in the cold and, after filtration, the xylene was distd. and the residue distd. *in vacuo*. The yield of *N-methylcarbazole* b_{11} 196-8°, m. 86-7°, was 80%.

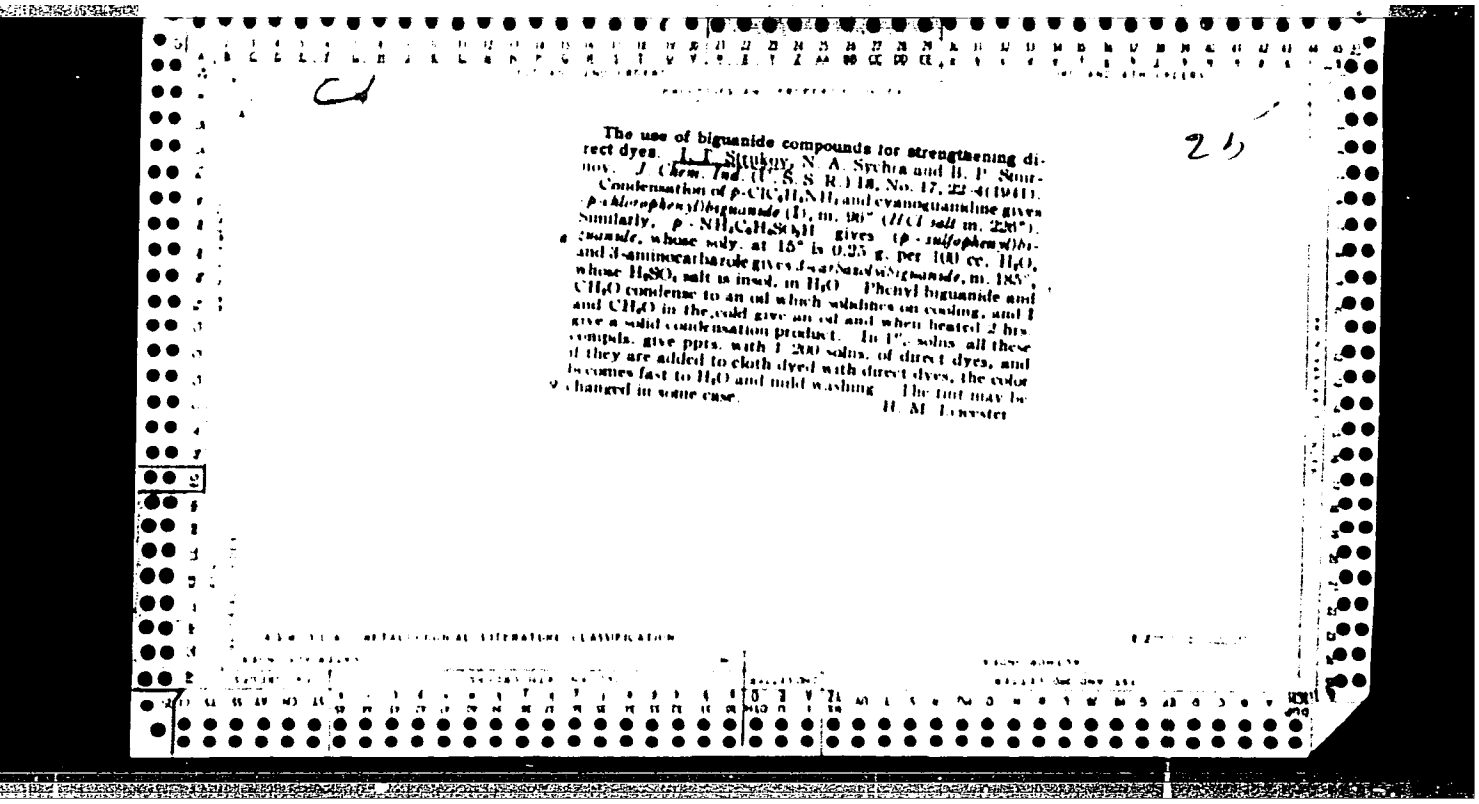
A. A. Podgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



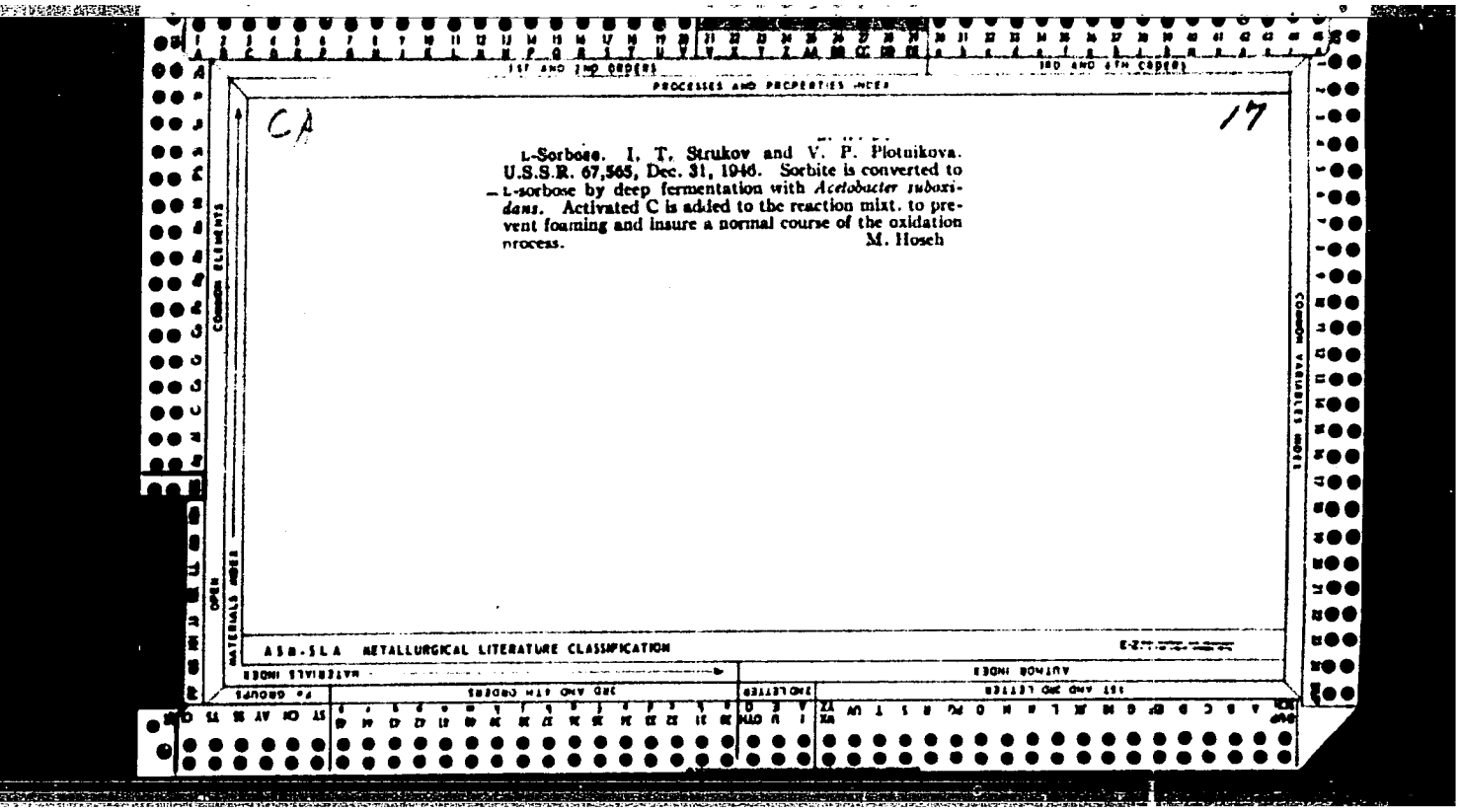
Making fast the dyeings produced by direct dyes I. I. Strukov and V. P. Smirnov. *J. Chem. Ind.* (U. S. S. R.) 18, No. 9, 12-16(1941); *Chem. Zentr.* 1943, I, 331.—In order to improve the washing fastness of direct dyeings, condensation products of dicyanodiamide and formalin dissolved in AcOH or in HCOOH are used. Soln. in HCOOH, however, causes some decompn. of the condensation product and lessens its ability to increase the fastness. The soln. of the condensation product in the theoretical amt. of AcOH gave good results. The condensation product is not uniform; it consisted of 3 substances, which influence the various dyes to different extents. The solns. increased the washing fastness but decreased the light fastness of the dyeings. The soln. of the condensation products in AcOH can be effected by introducing the AcOH at the beginning of the condensation. Such a soln. improves the washing fastness without influencing the light fastness.

Leopold Schellan



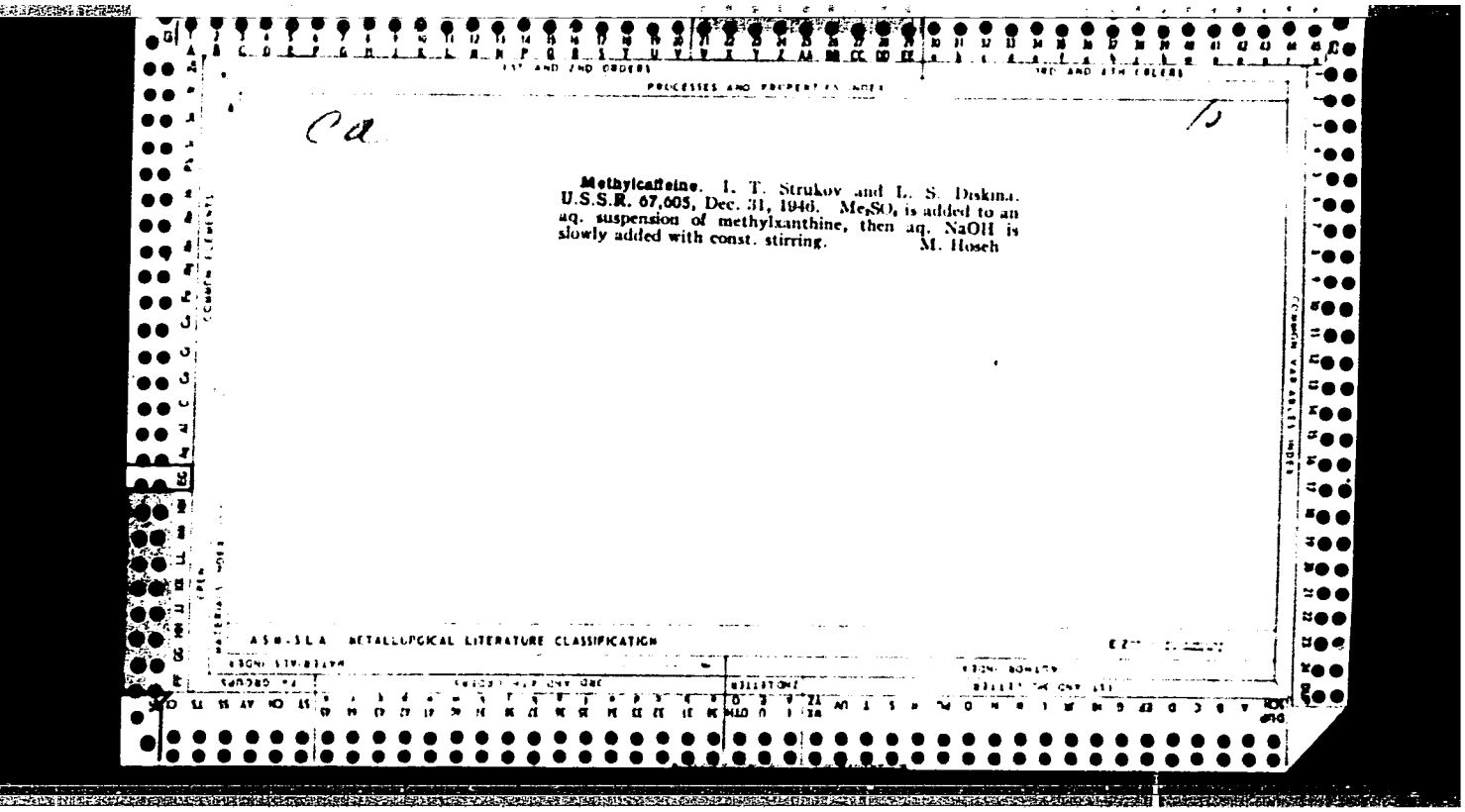
The use of biguanide compounds for strengthening direct dyes. I. I. Stitskiy, N. A. Sychra and B. P. Smirnov. *J. Chem. Ind.* (U. S. S. R.) 18, No. 17, 22-4 (1941). Condensation of *p*-$ClC_6H_4NH_2$ and cyanoguanidine gives (*p*-*chlorophenyl*)*biguanide* (I), m. 190° (*HCl salt* m. 230°). Similarly, *p*-$NH_2C_6H_4SO_2H$ gives (*p*-*sulfophenyl*)*biguanide*, whose sol'y. at 15° is 0.25 g. per 100 cc. H_2O, and β-aminocarbazole gives β-*carbazolylbiguanide*, m. 185°; whose H_2SO_4 salt is insol. in H_2O. Phenyl biguanide and CH_2O condense to an oil which solidifies on cooling, and I and CH_2O in the cold give an oil and when heated 2 hrs. give a solid condensation product. In 1% solns. all these compds. give ppts. with 1:200 solns. of direct dyes, and if they are added to cloth dyed with direct dyes, the color becomes fast to H_2O and mild washing. The tint may be changed in some case.

H. M. Leicester



CA 17

L-Sorbose. I. T. Strukov and V. P. Plotnikova. U.S.S.R. 67,565, Dec. 31, 1946. Sorbite is converted to L-sorbose by deep fermentation with *Acetobacter suboxidans*. Activated C is added to the reaction mixt. to prevent foaming and insure a normal course of the oxidation process.
M. Hoseh



Ca

15

Methylcaffeine. I. T. Strukov and L. S. Diskina. U.S.S.R. 67,605, Dec. 31, 1946. Me_2SO_4 is added to an aq. suspension of methylxanthine, then aq. NaOH is slowly added with const. stirring. M. Hosch

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

VO

Rationalization of the production of ascorbic acid (vitamin C). I. I. Strukov and N. A. Kopylova. *Farmatsiya* 10, No. 3, 8-12(1947). *Chem. Zentr.* (Russian Zone Ed.) 1948, I, 135; cf. U.S.S.R. 67,565 (C.A. 42, 7931a). The tech. method for the production of ascorbic acid (I) according to Reichstein (U.S. 2,265,121, *C.A.* 36, 1730[5]) follows the scheme: D-glucose → D-sorbitol → L-sorbose → diacetonesorbose (II) → diacetone-2-ketogulonic acid (III). The various steps were improved so that it was possible to obtain 1 kg. I from 2 kg. of sorbose instead of the 4 kg. ordinarily required. The following improved method for the formation of II is reported: To 50 g. finely powd. sorbose (92.5%) and 700 cc. Me_2CO at 20-25° stirred continuously is added 28 cc. $H_2SO_4.H_2O$ over a period of 20 min., the mixt. then cooled to 0-2°, another 14 cc. of H_2SO_4 added, the cold mixt. then added slowly (over a period of 2 hrs.) to 550 g. of 12% NaOH soln. (kept stirred and cooled to 5-10°), the Me_2CO distd. off, the II extd. from the residue with $C_2H_4Cl_2$ (250 cc., 4 extns.), 200 cc. of the solvent distd. off, first under normal pressure and later *in vacuo*, 100 cc. water is added to the light yellow liquid, and the vacuum distn. continued. The II remaining in the flask crystallizes readily, yield, 56 g. (83.8%). The following improved method is given for the prepn. of III: To 56 g. II, 300 cc. water and 25 cc. of 50% KOH at 20-45°, stirred continuously, 60 g. K manganate is added in small portions over a period of 1 hr., the excess oxidizing agent decompd. by the addn. of 25 cc. alc., the MnO_2 filtered off, the soln. cooled to 0°, III pptd. by the gradual addn. of concd. HCl, and the product washed with ice water and dried at 25-40°, yield 51 g. (81.1%). The total yield of III, calcd. on the sorbose, was 68%. Tech. I is frequently contaminated with *2-ketogulonic acid γ-lactone* (IV), which can be detd. by suitable titration. Both compds. can be titrated with 0.1 *N* NaOH. When the mixt. is titrated with 0.1 *N* iodine, I is converted into dehydroascorbic acid while IV remains unchanged. M. G. Moore

STRUKOV, I. T.

USSR/Chemistry - Pharmaceuticals Mar 52

"Thiazolidine-4-Carboxylic Acid and Its Derivatives. I. Compounds With Thiazolidine-Pyrrolidine Ring Systems," I. T. Strukov, Lab of Heterocyclic Compds, All-Union Sci Res Chem-Phar Inst imeni Ordzhonikidze

"Zhur Obshch Khim" Vol XXII, No 3, pp 521-527

Several thiazolidine-pyrrolidine-carboxylic compds were obtained from the hydro-chloride of l-cysteine and the diethyl ester of β, β-diethoxy-ethylmalonic acid. N-carbethoxy-thiazolidine-4-carboxylic acid was prepd. This compd, in its phys and chem properties, resembles N-acylthiazolidine-4-carboxylic acid.

209T50

STRUKOV, I. T.

USSR/Chemistry - Synthetic Drugs Jun 52

"Thiazolidine-4-Carboxylic Acid and Its Derivatives. II. S-Substituted Cysteins and Their Transformation Into Derivatives of Thiazolidine-4-Carboxylic Acid" I. T. Strukov, Lab of Heterocyclic Compds, All-Union Sci Res Chem-Phar Inst imeni Orzhonikidze

"Zhur Obshch Khim" XXII, No 6, pp 1025-1035

In condensation of dl-cystein with formylphenyl acetic acid ethyl ester, 2-(α-phenyl- α-carbethoxymethyl)-thiazolidine-4-carboxylic acid was obtained. No compds contg a thiazolidine- β -lactam ring system could be obtained from it. Hydroxymethylene

218T25

USSR/Chemistry - Synthetic Drugs (Contd) Jun 52

phenyl acetic acid was obtained from the diethylacetal of formyl phenylacetic ester. Condensation of the product with l-cystein yielded 2-benzylthiazolidine-4-carboxylic acid. The reaction between dl-cystein and hydroxymethylenephenylacetic acid in concd HCl yields the hydrochloride of S- β-(α-phenyl- α-carboxy)-ethylene cystein. dl-Cystein with methoxy methylene phenyl acetoethyl ester in concd HCl yields the hydrochloride of S- β-(α-phenyl- α-carbethoxy)-ethylene-cystein, which is easily converted into 2-(α-phenyl- α-carbethoxymethyl)-thiazolidine-4-carboxylic acid.

218T25

STRUKOV, I. T.

232T27

USSR/Chemistry - Pharmaceuticals Sep 52

"Oxymethylene-phenylacetic Acid and Its Derivatives," I. T. Strukov, Lab of Heterocyclic Compds, All-Union Sci Res Chem-Phar Inst imeni S. Ordzhonikidze

"Zhur Obshch Khim" Vol 22, No 9, pp 1615-1620

Derivs of hydroxy-, alkoxy-, and aminomethylene-phenylacetic acid were prepd. Some of the special characteristics of this class of compds were demonstrated.

232T27

[redacted], I. T.

"Thiazolidine -4-carboxylic acid and its derivatives. Part 3. Condensation of thiazolidine -4-carboxylic acid and its derivatives with -4-ethoxymethylene -2-phenyl-5(4)-oxazolone." (p. 1869)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1952, Vol. 22, No. 10.

SRUKOV I. I.

SRUKOV, I. T.

Chem Abs
v. 48: 25 Jan 54

Organic Chem.

Thiazolidine-4-carboxylic acid and its derivatives. IV. The condensation products of cysteine with 4-ethoxymethylene-2-phenyl-5-oxazolone. I. T. Srukov (S. Ordzhonikidze All-Union Chem.-Pharm. Inst., Moscow). *Zhur. Obshchei Khim.* 22, 2193–200(1952); cf. *C.A.* 47, 8063e.—Soln. of 0.4 g. *N*-acetyl-l-cysteine and 0.5 g. 4-ethoxymethylene-2-phenyl-5-oxazolone in 2 ml. pyridine gradually yielded yellow needles (I), m. 123° which was devoid of HS group and yielded pyridine on treatment with 10% NaOH. This (0.2 g.) with 1 ml. 2*N* HCl in 100 ml. Et_2O gave the pyridine-free product, $C_{15}H_{14}O_5N_2S$ (II), m. 166–8° (decompn.), which neither reacted with 0.1*N* iodine nor formed 4-aminomethylene-2-phenyl-5-oxazolone with 25% NH_4OH; the product II is identified as *S*-(*2-phenyl-5-oxo-2-oxazolin-4-ylidenemethyl*)-*N-acetylcysteine*. Heating 1.5 g. 4-ethoxymethylene-2-phenyl-2-oxazolin-5-one and 1.35 g. *N*-acetylpenicillamine in 5 ml. pyridine 5 hrs. at 50–5°, dild. with Et_2O and shaken with 10% H_2SO_4, the org. layer washed with 5% $NaHCO_3$, and the latter, treated with 1 l. Et_2O and 10% H_2SO_4, gave, on evapn. of the Et_2O ext., *S-(2-phenyl-5-oxo-2-oxazolin-4-ylidenemethyl)-N-acetylpenicillamine* (III), $C_{17}H_{19}O_5N_2S$, m. 176–7° (decompn.; from Me_2CO). Heating *N*-acetyl-l-cysteine with 4-aminomethylene-2-phenyl-2-oxazolin-5-one in pyridine gave no reaction in 10 hrs. at 55°. III (0.6 g.) kept 6 hrs. in 2 ml. concd. HCl gave $HO_2CCH(NHAc)CMe_2SCH:C(NHBz)CO_2H$, a powder. Heating 0.7 g. 4-aminomethylene-2-phenyl-2-oxazolin-5-one with 0.4 g. $PhNH_2$ in pyridine 25 hrs. at 80–90° then treated with 10% H_2SO_4, followed by MeOH, gave *4-anilinomethylene-2-phenyl-2-oxazolin-5-one*, m. 154–5°. Keeping 2.8 g. 4-ethoxymethylene-2-phenyl-2-oxazolin-5-one and 1 g. DL-cysteine-HCl in 15 ml. pyridine several hrs. gave a yellow ppt. of *S,N-bis(2-phenyl-5-oxo-2-oxazolin-4-ylidenemethyl)cysteine monopyridine salt*, decomp. 155–6° (from pyridine), which shaken with 2*N* HCl in Et_2O gave the free *acid*, yellow, decomp. 165–7°. The above pyridine salt (3 g.) kept 3 hrs. in 30 ml. 25% NH_4OH gave 1.00 g. *4-aminomethylene-2-phenyl-2-oxazolin-5-one*, decomp. 215–16°, while the aq. soln. treated with 10% HCl and product purified via the Na salt, gave $C_{13}H_{10}O_4N_2S$, m. 180–7° (decompn.), identified as the *amide* of *demethylphenylpenicilloic acid* (85%); the product carefully titrated with NaOH to phenolphthalein, treated with 1 drop HCl and treated with 0.1*N* iodine gave a soln. which reduced $AgNO_3$; with dinitrophenylhydrazine this soln. yields the *dinitrophenylhydrazone* of *formylhippuramide*, m. 207–8° (decompn.). To 5 g. $(EtO)_2CHCH(CO_2Me)NHCOPh$ in 30 ml. EtOH was added 50 ml. 25% NH_4OH and the soln. gave after 3 days $(EtO)_2CHCH(CONH_2)NHCOPh$ (IV), m. 168–9° (from MeOH), which, kept 1 hr. at 0° in concd. HCl, gave, on treatment with dinitrophenylhydrazine, the hydrazone, m. 208–9°, described above. IV (0.8 g.) and 0.5 g. DL-cysteine-HCl salt heated to 70° in 15 ml. 50% EtOH 5 hrs. gave on standing overnight the amide of demethylphenylpenicilloic acid, described above, m. 186° (decompn.). The formation of this apparently proceeds through S-(2-phenyl-2-oxazolin-4-ylidenemethyl)cysteine and 2-(2-phenyl-5-oxo-2-oxazolin-4-yl)-4-thiazolidinecarboxylic acid.

AF 7-26-54 G. M. Kosolapoff

STRUKOV, I.T.

✓ Mechanism of the reaction of the formation of pyrazolones substituted in the 2-position. I. T. Strukov. *J. Gen. Chem. U.S.S.R.* 23, 449-51(1953)(Engl. translation). —See C.A. 48, 3962e.

Strukov, I. T.

4-Thiazolidine-4-carboxylic acid and its derivatives. V. *S*-(2-Phenyl-2-oxazolin-5-on-4-ylmethylene)-*N*-acetylcysteine and its analogs. I. T. Strukov (S. Ordzhonikidze All-Union Chem.-Pharm. Inst., Moscow). *Zhur. Obshchei Khim.* **23**, 690–6(1953); cf *C.A.* **48**, 2688*g*, 5181*f*.—Heating 0.2 g. *S*-(2-phenyl-2-oxazolin-5-on-4-ylmethylene)-*N*-acetylpenicillamine with 2 ml. Ac_2O 10 min. at 100° gave yellow needles, m. 174–6°, also formed on similar treatment of *S*-(2-phenyl-2-oxazolin-5-on-4-ylmethylene)-*N*-acetylcysteine; the substance was identified as *PhC:N.C(:CHSAc).CO.O* (I). Removal of Ac_2O from the residual soln. gave *bis(2-phenyl-2-oxazolin-5-on-4-ylmethylene) sulfide*, decompd. 230–2°. The same substance, m. 233–5° (decompn.), was obtained by letting 4-mercaptomethylene-2-phenyl-2-oxazolin-5-one (IA) and 4-ethoxymethylene-2-phenyl-2-oxazolin-5-one (II) stand 24 hrs. in pyridine. Heating IA with Ac_2O 1 min. to 100° gave I. Heating 1 g. *N*-benzoylpenicillamine with 0.85 g. II in pyridine 12 hrs. at 80°, dilg. with 200 ml. Et_2O, and shaking with 40 ml. 10% H_2SO_4 yielded from the org. layer an unstated amt. of *S-(2-phenyl-2-oxazolin-5-on-4-ylmethylene)-N-benzoylpenicillamine*, m. 82–5°, which, heated with Ac_2O 2 min. at 100°, gave I and the mother liquor yielded a small amt. of *4-isopropylidene-2-phenyl-2-oxazolin-5-one*, m. 96–8° (from EtOH). *S*-(2-Phenyl-2-oxazolin-5-on-4-ylmethylene)-*N*-acetylpenicillamine (III) (0.5 g.) in 5 ml. NH_4OH allowed to stand overnight, evapd. *in vacuo*, and re-evapd. with HCl, yielded an amorphous mass which, extd. with Me_2CO and the ext. evapd., gave *$HO_2CCH(NHAc)$-$CMe_2SCH:C(CONH_2)NHBz$*, an amorphous solid. This in 4 ml. Me_2CO with 0.2 g. $PhCH_2NH_2$ gave the *benzylamine salt*, m. 138° (from EtOH-Me_2CO). III (0.6 g.) in 2 ml. concd. HCl let stand 1 day, then evapd., gave a colorless powder of *$HO_2CCH(NHAc)CMe_2SCH:C(CO_2H)NHBz$*, which does not evolve CO_2 on heating either in dry state or in aq. soln.; addn. of $PhCH_2NH_2$ in Me_2CO gave the *benzylamine salt*, decomp. 148–50° (from EtOH-Me_2CO). Heating 0.3 g. III with 5 ml. 1.5*N* HCl 3 hrs. at 100° gave CO_2 and *$S.CMe_2.CH(CO_2H).NH.CHCH_2NHBz.HCl$* (IV), decomp. 215–16° (from dil. HCl). Apparently in this reaction the 1st step is the opening of the oxazolone ring, loss of the Ac group, closure of the thiazolidine ring, and, finally, decarboxylation. During the thiazolidine-ring closure there is established an equil. when part of the phenylpenicilloic acid decomp. into penicillamine-HCl and unstable formylhippuric acid, the latter yielding CO_2 and $BzNHCH_2CHO$ which with the penicillamine-HCl forms IV. I has absorption max. 3600 A. and 3450 A.; a trace of bis(2-phenyl-2-oxazolin-5-on-4-ylmethylene) sulfide also produces 2 weak max., 4050 and 4200 A. G. M. Kosolapoff

'STRUKOV, I. T.

Chem

Formation of derivatives of β,β'-iminodiacrylic acid. I. T. Strukov, S. Ordzhonikidze [illegible]. *Zhur. Obshchei Khim.* 23, 1344-6(1953); cf. *C.A.* 47, 8690c.—Heating 1 g. di-Me β,β'-iminodi(α-phenylacrylate) with 10 ml. 10% KOH in MeOH 24 hrs. at 50–5° gave a ppt. which treated with C in H_2O and acidified gave the pure product in the form of *β,β'-iminodi(α-phenylacrylic acid)*, decomp. 168–70°. 4-Aminomethylene-2-phenyl-5-oxazolone in 24 hrs. in 25 ml. MeOH containing 5 g. dry HCl gave 4 g. $HN[CH:C(CO_2Me)NHCOPh]_2$, decomp. 230–1°. This heated with 10% KOH in MeOH gave a ppt., which was purified by soln. in H_2O and pptn. with HCl, yielding $HN[CH:C(CO_2H)NHCOPh]_2$, m. 165–6° (from MeOH). Reactions of these types are explained by 2 tautomeric forms of esters of β-aminoacrylic acid, in which the former are in equil. with the imino form and the preponderance of either can be controlled by conditions. Thus HCl favors the imino form, while traces of H_2O lead to cleavage with liberation of derivs. of malonaldehydic acid, which then can yield esters of iminodiacrylic acid. The traces of H_2O are those commonly found in the usual org. solvents like ROH and Et_2O. G. M. Kosolapoff

J. A. V-48
Jan 10, 1954
Organic Chemistry

MF 8-24-54

STRUKOV, I.T.

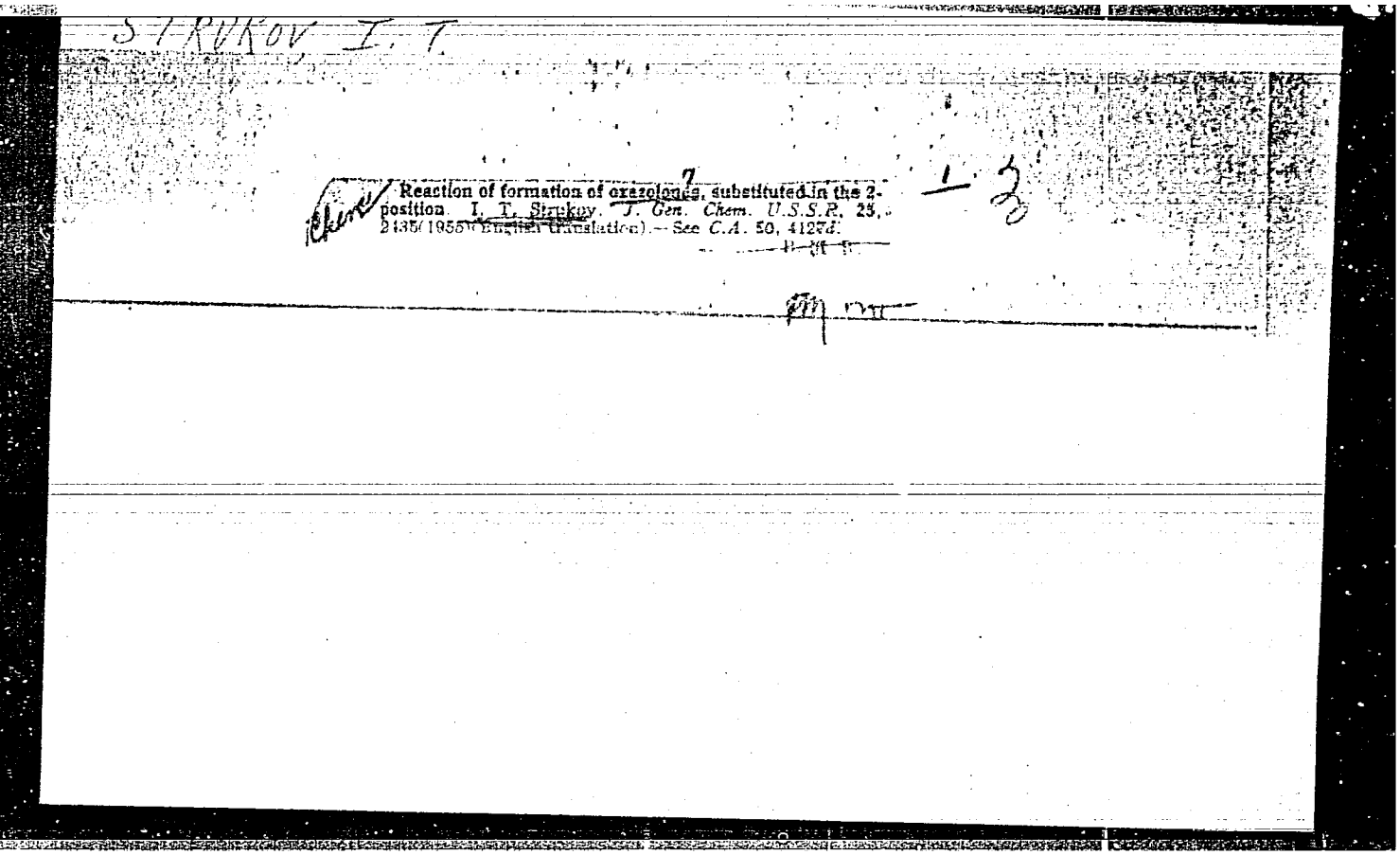
New method of preparation of derivatives of 4-thiazolidinecarboxylic acid. I. T. Strukov (S. Ordzhonikidze All-Union Chem.-Pharm. Inst., Moscow); *Doklady Akad. Nauk S.S.S.R.* 88, 483-6(1953); cf. *C.A.* 47, 2755f.—A method for the formation of 4-thiazolidinecarboxylic acid derivs. was devised on the basis of addn. of amino compds. to substances with an SCH:CH link. Examples follow. Treatment of $PhCH(CHO)CO_2Et$ with NaOH soln. gave a water-sol. Na salt of the hydroxymethylene form, which with Me_2SO_4 gave $MeOCH:CPhCO_2Et$, b_3 124-6°. This with $HSCH_2CH(CO_2H)NH_2.HCl$ in concd. HCl at 0° gave $HO_2CCH(NH_2.HCl)CH_2SCH:CPhCO_2Et$, decomp. 169-72°, which with pyridine in EtOH gave the free base, m. 153-4°, readily transformed into *S.CH₂.CH(CO₂H).NH.CHCHPhCO₂Et*, decomp. 169-70°. Condensation of cysteine-HCl with 2 moles 4-ethoxymethylene-2-phenyl-2-oxazolin-5-one (I) in pyridine gave the *pyridine salt* (II) decomp. 155-6°, of *S,N-bis(2-phenyl-5-oxo-2-oxazolin-4-ylidenemethyl)-cysteine*, which with 2*N* HCl in Et_2O gave the free acid (IIA), decomp. 165-7° (from Et_2O). II or IIA with concd. NH_4OH gives 100% 4-aminomethylene-2-phenyl-2-oxazolin-5-one, and (dedimethyl)phenylpenicilloic acid amide, $S.CH_2.CH(CO_2H).NH.CHCH(CONH_2)NHBz$ (III), m. 186-7° (decompn.). The former seps. immediately as a colorless ppt., while III seps. only after evapn. of NH_4OH *in vacuo* and acidification of the residue. The formation of III probably proceeds via *S*-(2-phenyl-5-oxo-2-oxazolin-4-ylidenemethyl)cysteine; it was independently prepd. by treatment of $(EtO)_2CHCH(CCl_3Me)NHBz$ with aq. alc. NH_4OH, which gave *2-formylhippuramide di-Et acetal*, m. 168-9°, and this in turn with cysteine-HCl gave III. Et ester (2-phenyl-5-oxo-2-oxazolin-4-ylidenemethyl)

Chemical Abst.
Vol. 48 No. 5
Mar. 10, 1954
Organic Chemistry

STRUKOV, I. T.

Strukov, I. T. -- "Investigation of Derivatives of Thiazolidine-4-carboxylic Acid and 5-Oxasolone."Min Public Health USSR, All-Union Sci Res Chemico-pharmaceutical Inst imeni S. Ordzhonikidze VNIKHFI, Moscow, 1955. (Dissertations for Degree of Doctor of Chemical Sciences)

SO: Knizhnaya Letopis', No. 23, Moscow, PP. 87-104.



SIRKOV I. T.

Reaction of formation of oxazolones substituted in the 2-position. I. T. Sirkov. *J. Gen. Chem. U.S.S.R.* 25, 2135(1955)(English translation).—See *C.A.* 50, 4127d.

STRUKOV, I. T.

CH ✓Reaction of formation of oxazolones, substituted in the 2-position. I. T. Strukov. *Zhur. Obshchei Khim.* 25, 2538(1955).—In the paper previously published (cf. *C.A.* 48, 3002e) the compd., m. 175-6°, is listed as the anhydride of *N*-acetylphenaceturic acid; this should read 2-benzylidene-3-acetyl-5-oxazolone. G. M. Kosolapoff

STRUKOV, I.T.

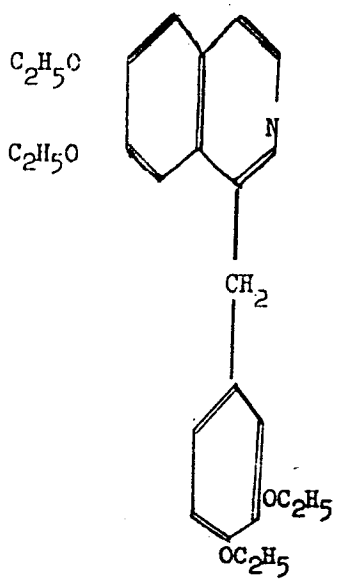
Thiazolidine-4-carboxylic acid and its derivatives. Part 6. Condensation products of α-amino-β-mercapto acids with 4-aminomethylene-2-phenyl-5-oxazolon. Zhur.ob.khim. 26 no.12:3422-3426 D '56. (MLRA 10:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze.
(Thiazolidinecarboxylic acid)

123. Methods of Synthesizing Papaverine

"Prospects for the Refinement of "Papaverine" Production," by I. T. Strukov, All-Union Scientific Research Chemicopharmaceutical Institute imeni S. Ordzhonikidze, Meditsinskaya Promyshlennost' SSSR, Vol 2, No 2, Feb 57, pp 19-23

The author describes three methods of synthesizing papaverine, a long-known effective spasmolytic agent. In the first method, either pyrocatechol or guaiacol is treated with dimethyl sulfate and a solution of sodium hydroxide to produce veratrole. The latter is chemically treated further until pure papaverine is obtained. Vanillin, nitromethane, and hippuric acid are utilized as the primary materials in the second method. Vanillin is used as the source materials in the third method. The author calls for the organization of the production of papaverine and its closest analogue, perperine. Perperine is not as toxic as papaverine and is three times as effective a spasmolytic as papaverine. It may be obtained from pyrotechol or ethyl vanillin. Its structural formula is:



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V-6

USSR/Pharmacology and Toxicology - Cardiovascular Drugs.

Abs Jour : Ref Zhur - Biol., No 14, 1958, 66362

Author : Strukov, I.T.
Inst : -
Title : A Contribution to the Problem of the Search for New Hypotensive Agents and Sedatives.

Orig Pub : Med. prom-st', SSSR, 1957, No 12, 6-13.

Abstract : No abstract.

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79-2-34/58

AUTHOR: Strukov, I. T.

TITLE: Thiazolidine-4-Carboxylic Acid and Its Derivatives. Part 7. Study of Condensation Products of Alpha-Amino-Beta-Mercapto Acids with 4-Chloro-methylene-2-Phenyl-5-Oxazolone and Its Derivatives. (Tiazolidin-4-karbonovaya-kislota i yeye proizvodnyye. VII. Izucheniye produktov kon-densatsii alfa-amino-beta-merkaptokislot s 4-khlormetilen-2-fenil-5-oksazolonom i yego proizvodnymi)

PERIODICAL: Zhurnal Obshchey Khimii, 1957, vol 27, No. 2, pp. 432-440 (U.S.S.R.)

ABSTRACT: Studying the conversions of 4-chloromethylene-2-phenyl-5-oxazolone, it was discovered that in certain cases the azlactone ring reacts much easier than the Cl atom or the chloromethylene group. When submitted to reaction with a water-alcohol ammonia solution, the azlactone was converted into amide of alpha-benzoylamino-beta-chloroacrylic acid. 1 n. solution of sodium hydroxide splits the azlactone ring forming sodium salt of alpha-benzoylamino-beta-chloroacrylic acid. The author investigated the reaction of 4-chloromethylene-2-phenyl-5-oxazolone with a solution of sodium hydroxide, ammonia and cysteine. The condensation of azlactone with penicillamine in alkali conditions yielded 1-thia-3-

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79-2-34/58

Thiazolidine-4-Carboxylic Acid and Its Derivatives, Part 7.

benzoylamino-4-keto-5-aza-7,7-dimethyl-2-cycloheptene-6-carboxylic acid and alpha-pencillamide of phenylpenicillic acid.

Reference is made to the article by I. L. Knunyants and Associates (12) in which it is shown that N-acrylylpenicillamine in the presence of alkali attaches the mercapto-group to CH_2 = Ch-bond forming 1-thia-4-keto-5-aza-7,7-dimethyl-cyclopentane-6-carboxylic acid. It was also found that the reaction of alkali with methyl ether of N-beta-(chloroacrylyl)-penicillamine leads to the formation ofmethyl ether 1-thia-4-keto-5-aza-7,7-dimethylcycloheptene-6-carboxylic acid.

There are 19 references, of which 5 are Slavic

ASSOCIATION: All-Union Scientific Research Chemical-Pharmaceutical Institute imeni S. Ordzhonikidze

Card 2/3

79-2-34/58

Thiazolidine-4-Carboxylic Acid and Its Derivatives, Part 7.

PRESENTED BY:

SUBMITTED: March 8, 1956

AVAILABLE: Library of Congress

Card 3/3

SOV/74-27-8-2/7

AUTHOR: Strukov, I. T. (Moscow)

TITLE: The Synthesis of Penicillins (Sintez penitsillinov)

PERIODICAL: Uspekhi khimii, 1958, Vol. 27, Nr 8, pp. 938 - 948 (USSR)

ABSTRACT: The synthesis of penicillins accomplished by Sheehan (Shikhan) in 1957 (Penicillin V(I)) is among the great achievements of organic chemistry. The synthesis of phenoxy-methyl penicillin is complex and expensive for which reason it could not yet be realized on an industrial scale. In the first chapter of his report the author deals mainly with the preparative work preceding the synthesis of penicillin (Refs 4-8). In the second chapter the author first discusses the investigations by Sheehan of simple model compounds (for the synthesis of the β-lactames and thiazolidine-β-lactames he used chlorine anhydrides of the diacyl amino acetates). The author then mentions the papers published by Sheehan and discusses them in detail. At the end of the investigations the successful synthesis of penoxymethyl penicillin is described (Refs 9-24). Sheehan has up to now succeeded in carrying out the syntheses of 10 types of penicillin. He is also to be merited for the discovery of new methods for

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the production of thiazolidine-β-lactames with different substituents in the side chain, and for finding the reasons for the impeditions of the cyclization of penicillic acids into penicillins. After the removal of these obstacles he succeeded in carrying out the synthesis of some compounds which, according to their structure had already been very close to penicillin. The two original methods for the production of thiazolidine-β-lactames with a phenyl acetamine group in the side chain found by the same scientists are also of great importance. There are 24 references, 1 of which is Soviet.

1. Penicillin derivatives---Synthesis

STRUKOV, I. T.

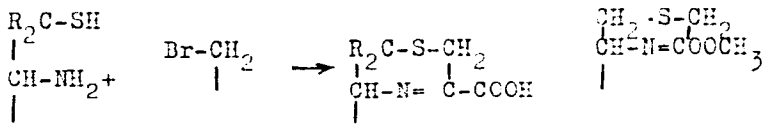
79-1-15/63

AUTHOR: Strukov, I. T.

TITLE: The Condensation of the Methyl Esters of α-Amino-β-Mercaptocarboxylic Acids With Bromopyrotartaric Acid (O kondensatsii metilovykh efirov α-amino-β-merkaptokarbonovykh kislot s brompirovinogradnoy kislotoy)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 1, pp. 69-71 (USSR)

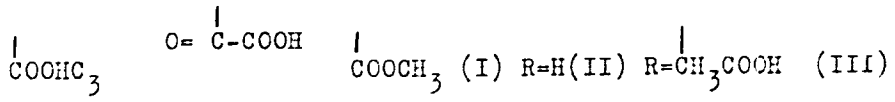
ABSTRACT: In the condensation of the methyl esters of l-cysteine (β-mercaptoalanine) and of dl-penicylamine with bromopyrotartaric acid in chloroform and in the presence of triethylamine the author obtained any yellow crystalline compounds (I) and (II) which have a free and an esterified carboxyl group. According to the analysis they represent derivatives of the 5,6-dihydrothiazine series, where the double bond according to the reaction process apparently is in the position 3,4:



Card 1/3

79-1-14/33

The Condensation of the Methyl Esters of α-Amino-β-Mercaptocarboxylic Acids With Bromopyrotartaric Acid



The final structure of the above-mentioned compounds has not yet been determined, as the possibility of a displacement of the double bond to the position 2,3 still exists. On heating of compounds (I) and (II) above 100°C they easily lose the carboxyl group. In the condensation of the cysteine chlorohydrate with the methyl ester of bromopyrotartaric acid the authors obtained the cysteine chlorohydrate and 5,6-dihydro-3-carbomethoxy-$\Delta^{3,4}$-thiazine-5-carboxylic acid (III). The bromine in the methyl ester of bromopyrotartaric acid apparently disposes of a positive charge and is inclined to an oxidation of the sulfide groups. The author synthesized a number of derivatives of 5,6-dihydro-$\Delta^{3,4}$-thiazine-3,5-dicarboxylic acids. There are 3 references, none of which is Slavic.

Card 2/3

79-1-15/63

The Condensation of the Methyl Ester of α-Amino-β-Mercaptocarboxylic Acids With Bromopyrotartaric Acid

ASSOCIATION: All-Union Scientific Research Institute imeni S. Ordzhonikidze (Vsesoyuznyy nauchno-issledovatel'skiy institut imeni S. Ordzhonikidze)

SUBMITTED: December 19, 1956

AVAILABLE: Library of Congress

Card 3/3 1. Chemistry 2. Methyl esters-Condensation

STRUKOV, I.T.; KOLGANOVA, O.A.; POTAPOVA, V.G.

Synthesis of new somnifacient preparations, tetridin and dimerin. Med.prom. 13 no.9:9-12 S '59. (MIRA 13:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze.
(PYRIDINE) (PIPERIDINE)

5 (3) SOV/79-29-7-54/83

AUTHOR: Strukov, I. T.

TITLE: The Use of N,N'-Dicyclohexylcarbodiimide for the Synthesis of Oxazolin-5-ones Substituted in Positions 2 and 4 (Primeneniye N,N'-ditsiklogeksilkarbodiimida dlya sinteza oksazolin-5-onov, zameshchennykh v polozhenii 2 i 4)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 7, pp 2359 - 2362 (USSR)

ABSTRACT: Among the carbodiimides (Ref 1), which are widely used for organic syntheses the N,N'-dicyclohexylcarbodiimide (Refs 2-5) occupies a prominent position by reason of its accessibility and easy handling. According to references 18-22, three syntheses for the oxazolin-5-ones have been described, of which the reaction of hippuric acid with N,N'-dicyclohexylcarbodiimidone proceeds least smoothly. The formation of the oxazolin-5-ones generally proceeds in the manner given in schemes (a) and (b). A special case of reaction (b) is the conversion of the diethylacetal of formylhippuric acid into the 2-phenyl-4-ethoxymethylen-oxazoline-5-one (II, R=C_2H_5OCH;R'=C_6H_5), an alcohol molecule being split off in the reaction. Apparently the second reaction proceeds more easily than the first. Of the compounds used for

Card 1/2

The Use of N,N'-Dicyclohexylcarbodiimide for the Synthesis of Oxazolin-5-ones Substituted in Positions 2 and 4 SOV/79-29-7-54/83

azlactone synthesis the N,N'-dicyclohexylcarbodiimide can only be recommended in some cases for an azlactone synthesis, seeing it is expensive compared with other compounds used for this purpose. Its advantages are, firstly, that it separates from the reaction mixture in the form of N,N'-dicyclohexylurea, which is practically insoluble, thus facilitating the purification process of the oxazolin-5-ones, and, secondly, that the reaction proceeds already at room temperature. There are 24 references, 2 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze (All-Union Scientific Chemico-pharmaceutical Research Institute imeni S. Ordzhonikidze)

SUBMITTED: May 15, 1958

Card 2/2

8-22/76

Thiazolidine-4-carboxylic Acid and Its Derivatives. VIII. On the Condensation of Cysteine With the Ester of α-Formyl-β-phenyl Propionic Acid and Its Derivatives

oxyphenyl)-propionic acid was transformed into the methyl ester (IV) (Ref 6), which was transferred into the ester (V) by means of sodium ethylate and benzyl chloride. The formyl group was introduced by condensation of compound (V) with ethyl formiate in the presence of sodium. Methyl-β-(p-benzyl oxyphenyl)-α-formyl propionate (XI) was condensed with the hydrochloride of l-cysteine. The benzyl group in the ester (VII) was cleaved by shaking with concentrated hydrochloric acid at room temperature (Scheme 2). There are 6 references.

ASSOCIATION: Nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze (Scientific Chemicopharmaceutical Research Institute imeni S. Ordzhonikidze)

SUBMITTED: July 30, 1958

STRUKOV, I.T.

4-Thiazolidinecarboxylic acid and its derivatives. Part 9: condensation of N-acetyldimethylcysteine with compounds having an aldehyde function. Zhur.ob.khim. 30 no.8:2701-2704 Ag '60. (MIRA 13:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze.
(Valine) (Thiazolidinecarboxylic acid)

STRUKOV, I.T.

Isoquinoline compounds. Derivatives of isomeric salsoline.
Zhur.ob.khim. 31 no.8:2709-2712 Ag '61. (MIRA 14:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze.
(Salsoline)

INOZEMTSEVA, I.I.; STRUKOV, I.T.; GOTOVTSEVA, V.A.

Prospects for the synthesis of new penicillins from 6-amino-penicillanic acid. Med.prom. 16 no.7:9-13 Jl '62. (MIRA 15:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov.
(PENICILLIN) (PENICILLANIC ACIDS)

VORONKINA, T.M.; STRUKOV, I.T.; SHOSTAKOVSKIY, M.F.

Synthesis of the precursors and fragments of antibiotics. Part 8: Preparation and study of the products of condensation of heterocyclic compounds with hydroxy- and mercaptomethyl esters. Zhur.ob.khim. 32 no.7:2097-2101 Jl '62. (MIRA 15:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov.
(Heterocyclic compounds) (Acetic acid) (Antibiotics)

VOPONKINA, T. M.; STRUKOV, I. T.; SHOSTAKOVSKIY, M. F.

Precursors and fragments of antibiotics. Part 9: Condensation of aliphatic aldehydes with mercaptoacetic acid and its ethyl ester. Zhur. ob. khim. 32 no.12:3877-3881 D '62. (MIRA 16:1)

(Aldehydes) (Acetic acid)

STRUKOV, I.T.; ZHDANOVICH, Yu.V.

4-Thiazolidinecarboxylic acid and its derivatives. Part 10: Transformations of 4-chloro- and 4-aminomethylene-2-phenyl-5-oxazolones. Zhur.ob.khim. 33 no.3:910-917 Mr '63. (MIRA 16:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov (VNIIA), Moskva.
(Oxazolinone)

STRUKOV, I.T.; TEBYAKINA, A.Ye.; INOZEMTSEVA, I.I.; KOSTROMINA, O.Ye.; KAMOKINA, Z.F.; BUYANOVSKAYA, I.S.; SHNEYERSON, A.N.; CHAYKOVSKAYA, S.M.; DRUZHININA, Ye.N.

2,6-dimethoxyphenyl penicillin (methycillin) and its microbiological study. Antibiotiki 8 no.8:690-694 Ag '63. (MIRA 17:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov.

PANINA, M.A.; STRUKOV, A.T.; TERYAKINA, A.Ye.; PUYANOVSKAYA, I.S.; SHUYSKOY, A.N.; SHARKOVSKAYA, S.M.; IVASHENINA, Ye.N.; RYBINSKAYA, P.S.; VENKINA, T.G.

5-methyl-3-phenyl-4-isoxazole penicillin (oxacillin) and its microbiological study. Antibiotiki 8 no. 11:989-994 N '63. (MIRA 17:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov.

STRUKOV, I.T.

Semisynthetic penicillins. Antibiotiki 8 no. 11:963-976 N '63. (MIRA 17:9)

STRUKOV, I.T.; VIKHROVA, N.M.; NIKITINA, N.M.; TERYAKINA, A.Ye.; BUYANOVSKAYA, I.S.; SHNEYERSON, A.N.; CHAYKOVSKAYA, S.M.

Phenoxybenzylpenicillin (phenbenicillin) and its microbiological study. Antibiotiki 9 no.1:3-7 Ja '64.

(MIRA 18:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov, Moskva.

INOZEMTSEVA, I. I.; KLEYNER, G. I.; PANINA, M. A.; KAMOKINA, Z. F.; STRUKOV, I. T.

"A study of physico-chemical properties of methicillin and oxacillin."

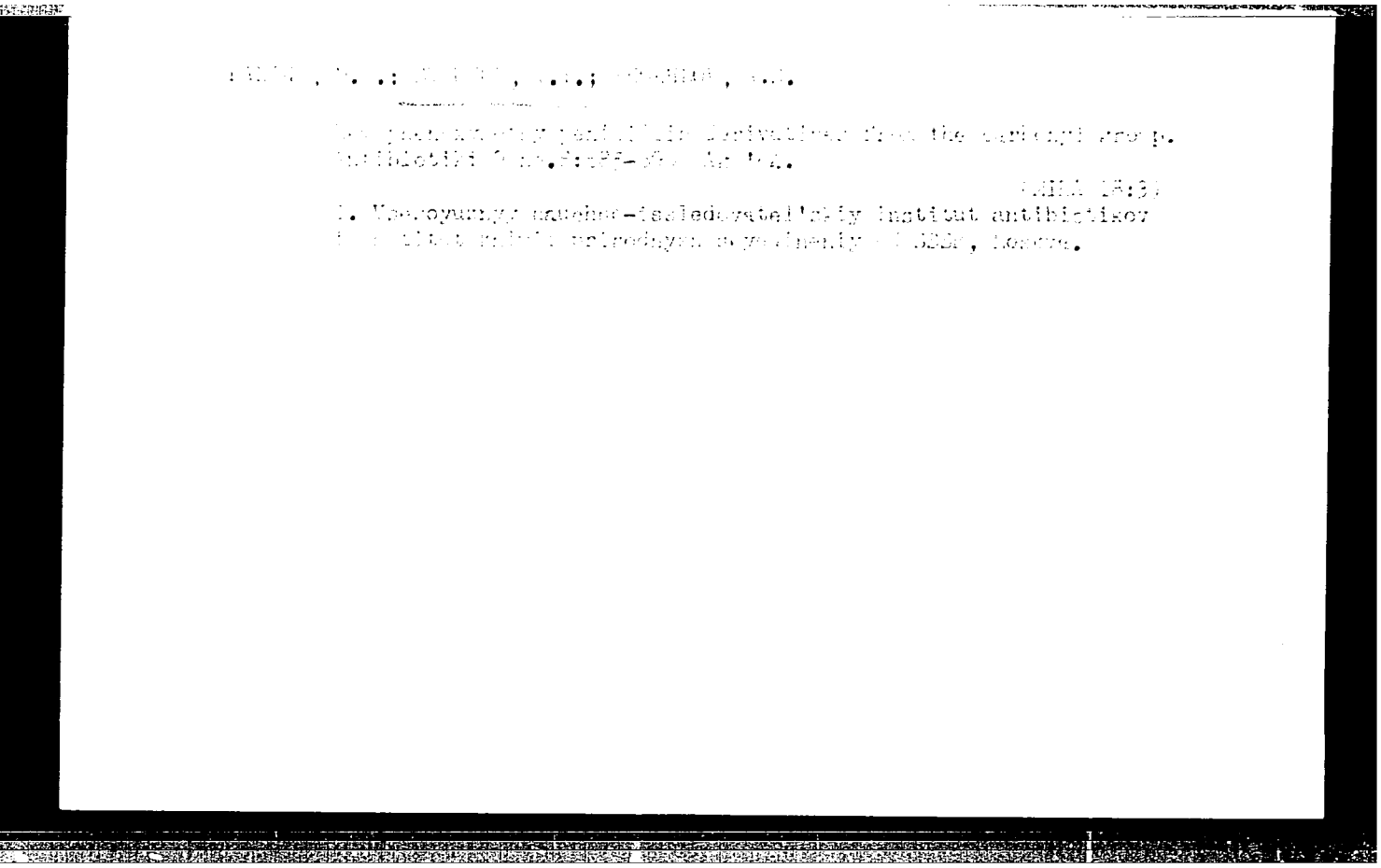
report submitted for Antibiotics Cong, Prague, 15-19 Jun 64.

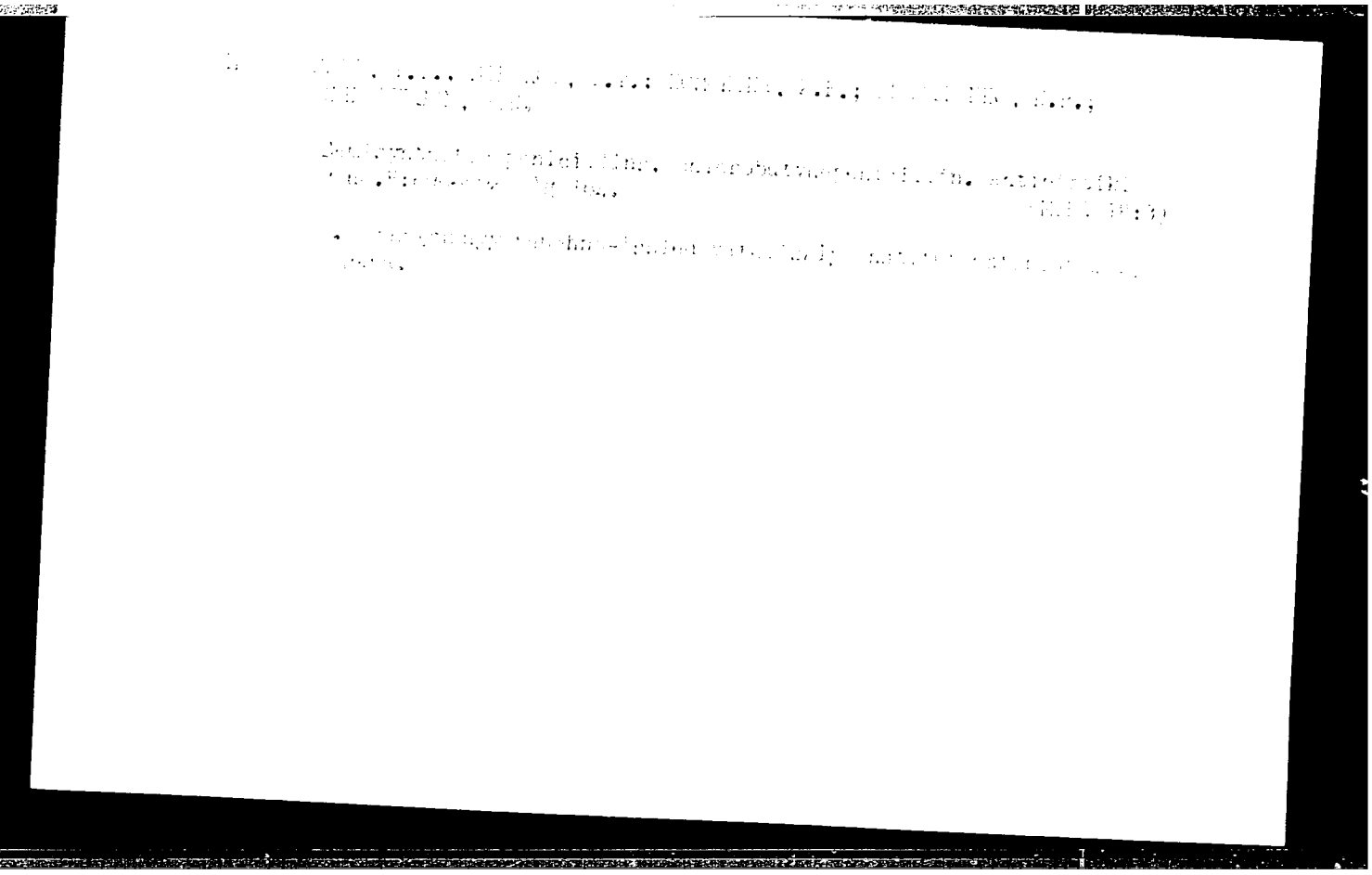
Cent Antibiotic Res Inst, Moscow & Factory for Medical Preparations, Riga.

TEBYAKINA, A.Ye.; BABINOVICH, M.S.; ZHDANOVICH, Yu.V. STRUKOV, I.T.; KONDRAT'YEVA, A.P.; BUYANOVSKAYA, I.S.; SHNEYERSON, A.N.; GRAGINSKAYA, P.S.; DRUZHININA, Ye.N.

Alpha-aminobenzylpenicillin (ampicillin) and its microbiological studies. Antibiotiki 9 no.5:389-392 My '64. (MIRA 18:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov, Moskva.





VORONKINA, T.M.; STRUKOV, I.T.; SHOSTAKOVSKIY, M.F.

Synthesis of precursors and fragments of antibiotics. Part 12: Condensation of organosilicon compounds with thioglycol acid and its ethyl ester. Zhur. ob. khim. 34 no. 5:1464-1467 My '64. (MIRA 17:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov.

MASIOVA, G.A.; STRUKOV, I.T.

4-Phenoxyacylaminocarboxylic acids and their derivatives. Zhur. ob. khim. 34 no.10:3411-3414 O '64.

New method of obtaining 3,5-disubstituted hydantoins. Ibid.:3506
(MIRA 17:11)

1. Laboratoriya organicheskogo sinteza Vsesoyuznogo nauchno-issledovatel'skogo instituta antibiotikov, Moskva.

L 45229-65

ACCESSION NR: AP5009021 S/0366/65/001/002/0348/0352

10
B

AUTHORS: Maslova, G. A.; Strukov, I. T.

TITLE: Polysynthetic penicillins. 1. Condensation of 6-aminopenicillic acid with azlactones and compounds with ethoxymethylene functions

SOURCE: Zhurnal organicheskoy khimii, v. 1, no. 2, 1965, 348-352

TOPIC TAGS: penicillin, organic derivative, molecular structure

ABSTRACT: The objective of this research was to produce and study penicillins with a structure differing from ordinary types (NHCO bond). Forms derived from 6-aminopenicillic acid combined with a side chain by an NHCH bond were investigated. One such compound was obtained by condensation of 6-aminopenicillic acid with 2-phenyl-4-ethoxymethylene-5-oxazolone, giving 6-(2'-phenyl-5'-oxazolone-4'-methylene amino) penicillic acid. Another compound was obtained by condensation of 6-aminopenicillic acid with 2-benzyl-4-methoxymethylene-5-oxazolone, yielding 6-(2'-benzyl-5'-oxazolone-4'-methylene amino) penicillic acid. Neither of these compounds has antibiotic properties. To verify that the NHCH bond is responsible for this lack of antibiotic properties, the authors made several other compounds of like structure, with similar results. The products were tested on the gram negative bacillus E.

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ACCESSION NR: AP5009021

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coli, the acid-fast saprophyte Mycobacterium phlei, and on several penicillin-producing staphylococci. The reason for the lack of antibiotic properties may lie in the steric peculiarities of the side-chain structure. "We express our sincere thanks to I. S. Buyanovskaya and A. N. Shneyerson, our co-workers at the Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov (All-Union Scientific Research Institute of Antibiotics) for determining the antibacterial spectra of the penicillins, and also to N. B. Dzegilenko and V. B. Korchagin for obtaining the IR spectra." Orig. art. has: 1 formula.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov (All-Union Scientific Research Institute of Antibiotics)

SUBMITTED: 06Jul63 ENCL: 00 SUB CODE: OC, LS

NO REF SOV: 003 OTHER: 018

Card 2/2

[illegible], L.M.; [illegible], I.I.; TERENT'EVA, A.Ye.; CHAYKOVSKAYA, G.N.; GAUZE, G.F.; [illegible], A.S.; ZUBOVA, V.G.

Rifeillin and its microbiological properties. Antibiotiki 10 no.1:3-9 Ja '65. (MIRA 18:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov, Moskva.

PANINA, M.A.; DUBOVA, V.G.; STRUKOV, I.T.; RYABOVA, N.M.; TEBYAKINA, A.Ye.

Cloxacillin and its microbiological study. Antibiotiki 10 no.11: 963-969 N '65. (MIRA 19:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov, Moskva. Submitted April 17, 1965.

MASLOVA, G.A.; STRUKOV, I.T.

Amide-imidol tautomerism in the penicillin series. Antibiotiki 10 no.11:1005-1010 N '65. (MIRA 19:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov, Moskva. Submitted April 15, 1964.

STRUKOV, L. P.

Strukov, L. P. - "Adaptations for regulating rail gaps using rails laid with Platov plates", Tekhnika zhel. dorog, 1948, No. 12, p. 22.

So: U-3042, 11 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 7, 1949).

STRUKOV, M.A.

AUTHORS: Smirnov, M.A., Strukov, M.A. 72-2-13/20

TITLE: Change of the Construction of the Unyte Pan for Plate Production (Izmeneniye konstruktsii tarel'chatogo unitaza).

PERIODICAL: Steklo i Keramika, 1958, Nr 2, pp. 32-32 (USSR)

ABSTRACT: The construction was changed as shown by the illustration, the old shape being indicated by a dotted line. The old shape presented difficulties in production and caused much waste. Master A.P. Korotkov changed the shape with the result that quality improved, weight could be reduced, and the waste quota became lower. There is 1 figure.

ASSOCIATION: Lobnya Works for Building Ceramics (Lobnenskiy zavod stroitel'noy keramiki).

AVAILABLE: Library of Congress

Card 1/1

AUTHORS: Smirnov, M.A., Strukov, M.A. 72-58-5-13/18

TITLE: Improved Gypsum-Moulds for the Battery-Casting for Washing Basins (Uluchshennaya konstruktsiya gipsovykh form pri batareynoy otlivke umyval'nykh stolov)

PERIODICAL: Steklo i Keramika, 1958, Nr 5, p 39 (USSR)

ABSTRACT: In washing basins cast in gypsum moulds, cracks formed at their front near the outlet openings after their drying and firing, which caused waste. It was not possible to avoid this waste by changing the composition of the mass, changing the technology of casting and working, or by changing the drying and firing regime. Then the construction of the gypsum mould was altered according to a suggestion by the foreman A.N. Korotkov; the drainage holes were arranged at the lower part of the basin and the gypsum moulds were organized in a battery inclined at an angle of 10-12° to the side of the outlet openings (see figure). Thereby the waste was avoided and it was no longer necessary to close the outlet opening as it is no longer visible and does not influence the quality of the basin. There is 1 figure.

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72-58-5-13/18

Improved Gypsum-Moulds for the Battery-Casting for Washing Basins

ASSOCIATION: Lobnenskiy zavod stroitel'noy keramiki
(Lobnya Factory for Structural Ceramics)

AVAILABLE: Library of Congress

1. Gypsum--Applications 2. Molding materials--Effectiveness

Card 2/2

AUTHORS: Smirnov, M.A., Strukov, M.A. 72-58-6-15/19

TITLE: Improved Construction of a Wash-Basin (Uluchshennaya konstruktsiya umyval'noy chashi)

PERIODICAL: Steklo i Keramika, 1958, . Nr 6, pp. 45-45 (USSR)

ABSTRACT: The wash-basin shown by fig. 1 was produced by the Lobnensk Works, but there was a lot of waste material owing to cracks. It was not possible, by changing the composition of the mass and the burning regime, to remedy this fault. Only after the rear part of the wash-basin had been reduced with respect to its height and the width of the board had been increased (fig. 2) was it possible to reduce the quantity of waste. There are 2 figures.

ASSOCIATION: Lobnenskiy zavod stroitel'noy keramiki (Lobnensk Works for Building Ceramics)

1. Ceramic materials--Processing 2. Industrial equipment--Construction

Card 1/1

AUTHOR: Smirnov, M. A., Strukov, M. A. SOV/72-58-7-15/19

TITLE: Weight Reduction of Plaster Molds for the Casting of Products for Sanitary Construction Products (Umen'sheniye vesa gipsovykh form dlya lit'ya sanitarno-stroitel'nykh izdeliy)

PERIODICAL: Steklo i keramika, 1958, Nr 7, pp. 45 - 45 (USSR)

ABSTRACT: The plaster molds for the casting of big semiporcelain products are produced from high-quality plaster. Up to 80 - 100 kg of plaster are necessary for the production of one piece. Such a plaster mold can generally be used 60 times. The rationalizers of the works developed a lighter construction of plaster mold which was reinforced by fins and required a smaller quantity of plaster, with constant strength and operation period (Figs 1 and 2). As a result of these construction changes the drying process of the molds was accelerated and their weight reduced as is shown by the table. Thus the plaster consumption was reduced by 60 t per year and the work of the foundry workers was considerably facilitated.

Card 1/2

Weight Reduction of Plaster Molds for the Casting of Products for Sanitary Constructional Products SOV/72-58-7-15/19

There are 2 figures and 1 table

ASSOCIATION: Lobnenskiy zavod stroitel'noy keramiki (Lobnya Works of Constructional Ceramics)

1. Ceramic materials--Processing 2. Molds--Materials
3. Molds--Design 4. Gypsum--Applications

Card 2/2

STRUKOV, M.A.

Operation by the Lobnya plant of the SM-461 casting and pre-drying conveyor for the production of toilet bowls. Stek. i ker. 19 no.7:29-33 Jl '62. (MIRA 15:7)

(Water closets)

STRUKOV, M.A.

Semiautomatic press for molding parts of sanitary engineering equipment. Stek.i ker. 20 no.2:39-40 F '63. (MIRA 16:2)

1. Lobnenskiy zavod stroitel'noy keramiki.
(Ceramics)
(Sanitary engineering--Equipment and supplies)

PEVZNER, M.S., dokter med. nauk, STRUKOV, M.V., dotsent

Prosthesis and orthopedic aid following amputation of the extremities. Ortop., travm. i protez. 26 no.8:51-56 Ag '65. (MIRA 18:9)

1. Iz Leningradskogo instituta protezirovaniya (dir. - dotsent M.V. Strukov). Adres avtorov: Leningrad, prospekt Karla Marksa, dom 9, Institut protezirovaniya.

9,2572

25959

S/141/61/004/001/019/022
E192/E382

AUTHORS: Akhmanov, S.A., Romanyuk, A.K. and Strukov, M.M.

TITLE: The Characteristics of a Double-tuned Parametric Oscillator

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol. 4, No. 1, pp. 179 - 181

TEXT: The purpose of this paper is to give some experimental results relating to the investigation of double-tuned parametric oscillators. The data on such oscillators seems to be scarce, except for the work of V.A. Lazarev (Ref. 2 - ZhTF, 10, 918, 1940), where the parametric excitation of a system consisting of two coupled tuned circuits was investigated theoretically and experimentally. The system considered in this work is in the form of two tuned circuits coupled by means of a periodically-changing reactance (similar to that of Ref 3 (H. Heffner, G. Wade - J. Appl. Physics, 29, 1321, 1958)). The principal parameter of interest in this system is its frequency stability, since it produces two frequencies f_1 and f_2, such that $f_1 + f_2 = f_H$, where f_H is the

Card 1/6

The Characteristics of 25959 ....

pump frequency. The frequencies f_1 and f_2 can be continuously varied by varying the resonant frequencies f_{01} and f_{02} of the tuned circuit in such a way that $f_{01} + f_{02} \simeq f_H$. In other words, a double-tuned oscillator of this type is variable while its pump frequency is fixed. The studied amplifiers cover the frequency range from 2 - 20 Mc/s as well as UHF (pump frequencies of 6 000 and 9 000 Mc/s). The variable reactances amployed were in the form of germanium p-n junction diodes. At UHf the tuned circuits had Q-factors of the order of 50 - 80 and the oscillators were excited at pump powers of 10 - 20 mW; on the other hand, the oscillators for the lower frequencies were excited at pump signals of 1.5 - 2 V. The power generated by the oscillators was 10-14 db lower than the pump power. The steady-state amplitude of the oscillator output was largely dependent on the nonlinear conductance of the diodes. The frequency-stability measurements were carried out by using a crystal-stabilized

Card 2/6

pump-source generator operating at f_H = 28 Mc/s. The block schematic of the measuring system is given in Fig. 1. In the first series of experiments, the frequencies f_1 and f_2 were varied between 11 and 13 Mc/s and 17 and 15 Mc/s, respectively; in the second group of experiments, $f_1 \simeq 5$ Mc/s and $f_2 \simeq$ 23 Mc/s. The experimental results showing the dependence of the generated frequency on the changes of the reactances in the tuned circuits are shown in Fig. 2. The axis of the abscissae shows the relative change $\Delta C_1/C_1$ of the tuning capacitance C_1 of the first circuit, while the axis of the ordinates gives the corresponding relative change $\Delta C_2/C_2$ of the capacitance C_2 of the second circuit, which is necessary to ensure the stability of the frequency f_1. It is seen that the signs of ΔC_1 and ΔC_2 coincide and that for $Q_1 = Q_2$, the ratio $\Delta C_1/C_1 = \Delta C_2/C_2$ (see Curve 1). In general, these two ratios differ by a

factor K , which is dependent on the damping of the circuits; for the graphs II and IV, $Q_1 > Q_2$, while for the graph III $Q_1 < Q_2$. It is concluded, therefore, that the "unilateral" deviations of the reactive parameters in a double-tuned parametric oscillator are mutually compensated. The frequency stability of the system is dependent, to some extent, on the pump voltage and this effect amounted to 50 - 70 cps/V. The influence of the fluctuations of the variable reactance diode on the frequency stability can be made negligible since the temperature coefficient of the p-n junction is low and the biasing source for the diode can be made very stable. The authors express their gratitude to Yu.Ye. D'yakov for suggesting the formulae and for valuable remarks, to S.D. Gvozdover for his interest in this work and to A.V. Krasilov for supplying the semiconductor diodes.

25959 S/141/61/004/001/019/022
The Characteristics of E192/E382

There are 2 figures and 6 references: 2 Soviet and 4 non-Soviet. The four English-language references quoted are: Ref. 3 (quoted in text); Ref. 4 - A. Uhlir, Proc. IRE, 46, 1115, 1958; Ref. 5 - Hsu-Hsiung - NSIA-ARDC Conf. Electron., Washington, 1958, p. 81; Ref. 6 - P. Fitzgerald, G. Wade and C. Crumly, IRE Trans. Electron. Devices, 6, 243, 1959.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet
(Moscow State University)

SUBMITTED: July 9, 1960

Card 5/6

AKHMANOV, S.A.; D'YAKOV, Yu.Ye.; ROMANYUK, A.K.; STRUKOV, M.M.

Stable wide-band generator with a nonlinear reactance. Prib.i tekh.eksp. 6 no.5:92-97 S-O '61. (MIRA 14:10)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta.
(Pulse techniques (Electronics))

AUTHOR: Akhmanov, S. A.; Kovrigin, A. I.; Strukov, M. M.; Khokhlov, R. V.

TITLE: Frequency characteristic of a threshold of light-induced air breakdown

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 1, 1965, 42-47

TOPIC TAGS: laser, glass laser, neodymium glass laser, laser emission harmonic, KDP laser interaction, laser gas breakdown, laser beam ionization

ABSTRACT: In an effort to determine the extent to which cascade ionization or multiphoton processes contribute to gas breakdown by a focused laser beam, measurements were made of the frequency characteristic of the threshold electric field in the beam. The fundamental (1.06 μ) and the second harmonic (0.53 μ) of a neodymium-doped glass laser were used for this purpose. The second harmonic of the laser, which was equipped with a Q-spoiler, was obtained in a KDP crystal 2 cm long. The laser emission was focused by a lens system with $f = 4$ and 6 cm. The average ratio of threshold energies of the fundamental to the second harmonic as measured by the calorimeter was 0.6, using the 4-cm lens, and 0.63 using the 6-cm lens. Typical absolute values of the threshold field intensity due to the fundamental frequency beam were of the order of $5—10^6$ v/cm. It is concluded that the

Card 1/2

ACCESSION NR: AP5013672

cascade ionization effect is dominant in the breakdown mechanism for wavelengths longer than 0.53 μ. The use of harmonics also affords the opportunity to study the breakdown in biharmonic fields. Preliminary experiments showed that in air there is a cumulative action of the fundamental and second harmonic. The authors are also interested in the study of the breakdown frequency characteristic in condensed media. Some results of studies of the breakdown in liquids are to be published elsewhere. Orig. art. has: 2 formulas. [SK]

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: 20Feb65 ENCL: 00 SUB CODE: EC

NO REF SOV: 006 OTHER: 005 ATD PRESS: 4003

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EWA(k)/FBD/EWG(r)/EWT(1)/EWT(m)/EEC(k)-2/EWP(j)/EEC(t)/T/EEC(b)-2/ EWP(k)/EWA(m)-2/EWA(h) Pn-4/Po-4/Pf-4/Pi-4/Pl-4 SCTB/IJP(c) WG/GW

ACCESSION NR: AP5010522 UR/0056/65/048/004/1202/1204

AUTHOR: Akhmanov, S. A.; Kovrigin, A. I.; Kulakova, N. K.; Romanyuk, A. K.; Strukov, M. M.; Khokhlov, R. V.

TITLE: The threshold and line intensity of stimulated Raman scattering in liquids

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 4, 1965, 1202-1204

TOPIC TAGS: stimulated Raman scattering, Raman scattering threshold, Raman scattering line intensity

ABSTRACT: Stimulated Raman scattering (SRS), at which coherent oscillation of molecules of the scattering medium is generated, has a threshold $\beta_{ci}E_o^2 \geq \delta_{ci}$, where E_o is the field intensity of the incident wave, (frequency ω_o), β_{ci} is a value determined by the polarization of the molecule of the scattering medium at frequency $\omega_o - \Omega = \omega_{ci}$ (Ω is the natural frequency of molecular oscillation), and δ_{ci} is the absorption coefficient of the medium at ω_{ci} frequency. Experiments on the excitation of SRS were performed with organic liquids (benzene and

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cyclohexane)[11] in order to establish the factors which determine the value of the threshold and line intensity in ranges shorter than that of ruby laser ($\lambda_0 \approx 0.69\mu$). The second harmonic of a neodymium glass laser ($\lambda_0 = 0.53\ \mu$) was used to excite SRS. The investigations showed a substantial decrease in SRS threshold in comparison to corresponding values at $\lambda_0 \approx 0.7\mu$. In benzene, SRS was approximately half that at $\lambda_0 \approx 0.7\mu$ under the same investigation conditions. This could be the result of the fact that 1) with the rise of operational frequency ω_0 the value β_{ci} increases or 2) the diameter of the focal spot of the generator of optical harmonics can be considerably smaller than that of the ruby laser, due to a smaller divergence of the harmonic beam. The intensity of SRS grows with the distance between the forward edge of the vessel and the focus. Generators of harmonics, in addition to their use for observation of SRS in the vicinity of electron absorption bands, can also be used for the investigation of SRS and nonlinear absorption effects in intensive biharmonic fields (including both Raman scattering of the harmonic field by coherent molecular oscillations excited by a wave of fundamental frequency and nondegenerated multiphoton absorption). Orig. art. has: 2 formulas and 2 tables. [JA]

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ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

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Card 3/3

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"A Transverse Transplantation of the Sinews which Bend the Wrist so as to Activate Fingers in Cases of Paralysis of the Radial Nerve," Khirurgiya, No. 6, 1949. Clin. of Hospital Surgery, Naval Med. Acad. -c1949-.

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USSR / Forestry. Forest Management. K

Abs Jour: Ref Zhur-Biol., No 7, 1958, 29541.

Author : Strukov, M. V.
Inst : Not given.
Title : Forestry in the Central Urals.
(Lesnoye khozyaystvo Srednego Urala).

Orig Pub: Lesn. kh-vo, 1957, No 10, 27-30.

Abstract: No abstract.

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